Summary & Key Actions

This Bike Walk Action Plan was prepared to maximize biking and walking within Saint Paul's Central Corridor and to enhance access to the Central Corridor light rail transit (LRT) line which is scheduled to be constructed between downtown Saint Paul and downtown Minneapolis beginning in 2010. The LRT line will greatly expand mobility options and will change the environment of University Avenue, the State Capitol area and downtown Saint Paul. The bicycle and pedestrian improvements recommended in this Plan, coupled with LRT access and bus system changes, will create tremendous new non-vehicular transportation options.

This Plan contains an evaluation of existing pedestrian and bicycling conditions, bikeway and walkway framework plans and recommended priority actions to improve biking and walking.

Bike Summary

1

Existing Condtions

The Saint Paul Center Corridor is a diverse area spanning from the Saint Paul/Minneapolis border on the west to the east edge of downtown Saint Paul and centered on the alignment of the future Central Corridor LRT line which follows University Avenue through the State Capitol area and into downtown Saint Paul.

From a biking and walking perspective, the Central Corridor has many assets and many needs. There is good pedestrian access to most of the Corridor along a network of sidewalks following the street grid. However, sidewalks on most busy streets are less than friendly environments for pedestrians as they lack buffers from traffic, have few basic amenities like shade or seating and residents have concerns about the safety of crossing some busy intersections. The grid street pattern contributes to a good network of low traffic streets, but significant barriers to biking exist in busy roads, railroads and highway crossings. Saint Paul and the Central Corridor have few bike facilities such as off-street trails or on-street bike lanes. A summary of existing bike-walk conditions is listed below.

Pedestrian Friendliness

Table 1.1 Pedestrian Friendliness Summary

	West of Prior	East of Prior	Down-town	Rail Crossings	Highway Crossings
Intolerant	●			●	
Tolerant		●	●		●
Friendly			●		
Pedestrian Place			●		

Bike Friendliness

Table 1.2 Bike Friendliness Summary

	Major Streets	Minor Streets	Resi-dential Streets	Access to Bike-ways	Presence of Way-finding & Route Marking	Pres-ence of Support Facili-ties
Intolerant	●			●	●	●
Tolerant		●	●	●	●	
Friendly			●			

Barriers

I-94, railroads, I-35E, I-94 vehicle bridges, space limitations in many street corridors.

Key Features

Neighborhood streets with sidewalks, Summit Ave. bike lanes, I-94 ped/bike bridges, Vento trail, Shepard trail, skyway system downtown, few bike trails or bike lanes, few pedestrian or bike friendly streets.
Some pedestrian-friendly streets downtown such as St. Peter, Wabasha, Exchange and 4th .
Pedestrian friendly places downtown such as Rice Park, Mears Park, Farmers Market, 7th Place, Wacouta Commons, etc.

Key Areas of Change

LRT route, redesigned and narrowed University Avenue (lanes and sidewalks), future Ayd Mill/Midtown multi-use trail, future redevelopment near LRT stations.

Caption

Allocation of Transportation Resources

- 10% of all trips are bike or walk trips
- 13% of traffic fatalities are pedestrians or bicyclists
- 1% of Federal transportation funding goes to bike/ pedestrian facilities

Bikeway Framework Plan

The Bikeway Plan envisions an interconnected system of regional, commuter and local bikeways relying primarily on lower volume streets. The regional bikeways would use off-streets paths and dedicated on-street bike lanes. The regional routes are designed to create a bikeway loop around the Central Corridor and to connect to other regional bikeways. The commuter routes would have bike lanes or shared marked bike routes (sharrows), where room for dedicated bike lanes is not possible. The local bikeway routes would be bike boulevards (low volume residential streets with traffic calming) which would connect to LRT stations and key community destinations. Refuge islands would be added at non-signalized crossings of major streets.

Bike lanes and sharrows would be added to downtown routes and bikeways and pedestrian oriented streets would receive traffic calming treatments. Key bikeway connections to downtown would be improved (Kellogg, Jackson, and to the Vento Trail and Sam Morgan Trail).

A system of bike route way-finding signage and pavement markings will tie the system together, directing cyclists and raising awareness for motorists.

Prior and Chatsworth - Before

Photo Visualization Prior and Chatsworth Bikeways - After

Walk Summary

Bike racks would be added along University Avenue and at local North-South street connections to LRT stations. Secure bike storage (indoors, in parking structures or in bike stations) would be added near the Raymond, Snelling, Dale, Rice, 4th/Cedar and Union Depot LRT stations. Bike stations are envisioned as full service facilities with secure bike storage, bike repair, showers and lockers.

A system of bike route way-finding signage and pavement markings will tie the system together, directing cyclists and raising awareness for motorists.

Key Elements of the Bikeway Plan

- » Create a network of bikeways on lower volume streets (regional, commuter and local bikeways).
- » Create a regional bikeway loop around the Central Corridor.
- » Add commuter bike routes along secondary streets (E-W and N-S). Use existing pedestrian/bike bridges over I-94.
- » Improve bike connections in and out of downtown.
- » Calm vehicular traffic downtown and on local bike boulevards.
- » Create landscaped bike and pedestrian friendly streets connecting to University Avenue and in downtown.
- » Install a comprehensive bike route way-finding system and secure bike parking.
- » Create a new off-road multi-use trail (Midtown Greenway along the railroad corridor.

Walkway Framework Plan

The Walkway Plan is designed to complete the sidewalk network and make downtown and key corridor streets more inviting to pedestrians.

Key Elements of the Walk Plan

- » Make walkways along major streets and in downtown more pedestrian friendly by implementing wider sidewalks with high quality landscaping, and adding decorative pavement, street furnishings and pedestrian scale overhead lighting.
- » Make crossing streets safer and more convenient by adding more traffic signals, adjusting walk time at signals, installing pedestrian refuge islands, heightening traffic law enforcement, using pedestrian-oriented intersection design and installing traffic-calming strategies such as narrowing streets and travel lanes, expanding visual corridors and reducing speed limits.
- » Filling key sidewalks gaps, particularly west of Fairview.
- » Creating more pedestrian-friendly destinations near LRT stations.
- » Improve the look and feel of pedestrian/bike bridges across I-94.
- » Install a comprehensive pedestrian-scale way-finding system.

Caption

Caption

Recommended Priority Actions

Bike-Improvements:

- Complete the Pelham/Raymond bikeways.
- Build the Midtown Greenway bike trail.
- Add bike lanes on Pierce Butler and off road bike trail on the potential St. Anthony Greenway connection.
- Add striped bike lanes to Griggs.
- Add bike lanes to Prior.
- Add bike lanes to Mackubin.
- Create a combination of shared off road bike walk and on street bike lanes on Kellogg from John Ireland to Smith.
- Implement a “road diet” to narrow Sibley/Jackson and add striped bike lanes.
- Add streetscaping along 5th and 6th Streets to calm traffic and include bike lanes/sharrows.
- Turn Charles Avenue from Prior to Makubin into a bike boulevard.
- Add a bikeway on Territorial to connect Pierce Butler to the U of M transitway.
- Add wayfinding signs and pavement markings on Phase one demonstration area.
- Build bike stations at the 4th/Cedar and Union Depot LRT stations and work to add secure bike parking near Raymond, Snelling and Rice Street LRT stations.

Pedestrian Improvements:

- Add high quality streetscape from Wabasha to Cedar on 5th, 6th and 4th Streets.
- Improve streetscape from Mears Park to the Mississippi River on Sibley.
- I -94 pedestrian/bike bridge improvements - lighting, railings, landscaping, safer approaches, signed crosswalks at Concordia/ St. Anthony.
- Pedestrian Improvements on Prior (I-94 to University).
- Add new sidewalks to fill major gaps in the infill area:
  - Create a walkway route extending from Charles Avenue East of Fairview Avenue.
  - Create green street connections between Charles and University at LRT station platforms.
  - Add walkways with streetscape buffers on Cretin by Town and Country golf course.
  - Add sidewalks with streetscape buffers on Prior North of University.
  - Territorial (Add)

Pedestrian and Bicycle Friendly Recommendations:

- Adopt a Complete Streets ordinance/policy to enable safe, attractive, and comfortable access and travel for all users (pedestrians, bicyclists, motorists, and public transport).
- Hire full time bicycle, pedestrian, and complete streets coordinators and part time seasonal bike ambassadors (for promotion, outreach and awareness).
- Expand bike walk promotion and awareness with partnership events (i.e. car free street closure days, bike-walk carnivals, etc.), products (bike route maps, on-line bike routes) and programs with partners such as Smart Trips, schools, bike organizations, neighborhoods, the Metropolitan Council and others.
- Increase enforcement of traffic laws (for vehicles, pedestrians and cyclists) to calm traffic and create a safer bike and pedestrian environment.

Caption

Introduction

Purpose

The Metropolitan Council, the Twin Cities regional planning and transit agency, in coordination with the cities of Minneapolis and Saint Paul is preparing final plans for construction of the Central Corridor light rail transit (LRT) line between downtown Saint Paul and downtown Minneapolis, Minnesota. The Central Corridor LRT line will run 11 miles between the two downtowns primarily along University and Washington Avenues and will connect to the existing Hiawatha LRT line which runs between downtown Minneapolis and the Minneapolis Saint Paul International Airport and the Mall of America. Central Corridor LRT construction is scheduled to begin in 2010 and be operational by 2014.

The City of Saint Paul commissioned this Bike Walk Action Plan to assure that bike and walk connections and facilities create a safe and inviting pedestrian and biking environment around the LRT line and within the greater Central Corridor area. The plan is also designed to set priorities and strategies for creating a bike and walk friendly environment. Biking and walking are crucial to the success of Central Corridor LRT as the station areas are not designed for, nor are they appropriate for park and ride sites. Since virtually all transit riders are pedestrians or bicyclists at one or both-ends of their trips, a pedestrian and bike friendly enviornment is critical to the success of LRT operations. This Plan builds on other previous and current plans for the Central Corridor LRT and within the City of Saint Paul, including the **Central Corridor Development Strategy**, the University Avenue Station Area Plans, ongoing Downtown Station Area Planning, the Transportation and Parks Chapters of the Comprehensive Plan, the **Downtown Development Strategy**, and the **Downtown Bicycle Plan.**

Benefits of a Pedestrian and Bike Friendly Corridor

Bicycling and walking provide environmental, social, health, and economic benefits to the community and to the individual. Biking and walking are a function of a supportive transit environment. Cities with a physical infrastructure that supports biking and walking have higher levels of bicycle, pedestrian and transit trip use and lower levels of driving. Cities without supportive bikeways and walkways rely largely on driving, leading to traffic congestion, increased air pollution, obesity, higher health care costs, and fewer mobility options.

A goal for Saint Paul is to have a balanced transportation system that provides options for transit, walking, biking and driving. Currently, the lack of mobility options encourage driving. LRT greatly enhances transit options. Creating a connected and pleasant biking and walking environment will not only enhance transit use, it will create more options for mobility. Specific economic, environmental and social benefits of biking and walking are listed below.

Economic

- » Reduced dependence upon high priced gasoline.
- » More options for commuting and transportation.
- » Increased ease of transit use.
- » More affordable travel options and reduced dependency on auto ownership.
- » Improved livability - positive factor in attracting businesses and workers as well as tourism.

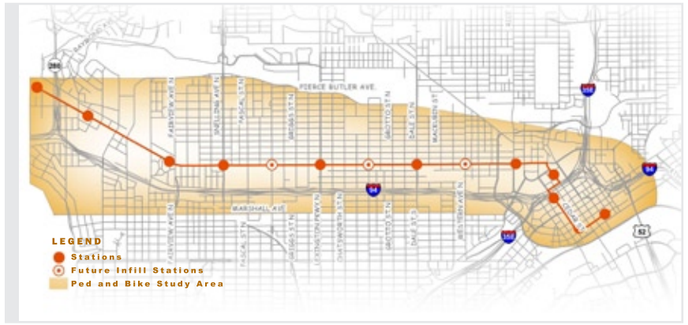
Environmental

- » Reduced energy consumption.
- » Less pollution and green house gas emissions.
- » Reduced traffic congestion.

Social and Health

- » A healthier more physically active population.
- » Improved physical and mental health.
- » Lower health care costs.
- » Improved quality of life.
- » More vital active neighborhoods and business districts.
- » Safer streets and business districts.
- » More independent and active seniors.
- » Increased opportunities for social contact which strengthens sense of community and place.

Corridor Setting



Most of the Central Corridor LRT line within Saint Paul will run down the center of University Avenue, a 5.5 mile corridor stretching from the Minnesota State Capitol to the Saint Paul/Minneapolis border. A short portion of the LRT line will run from the State Capitol through downtown Saint Paul to Union Depot.

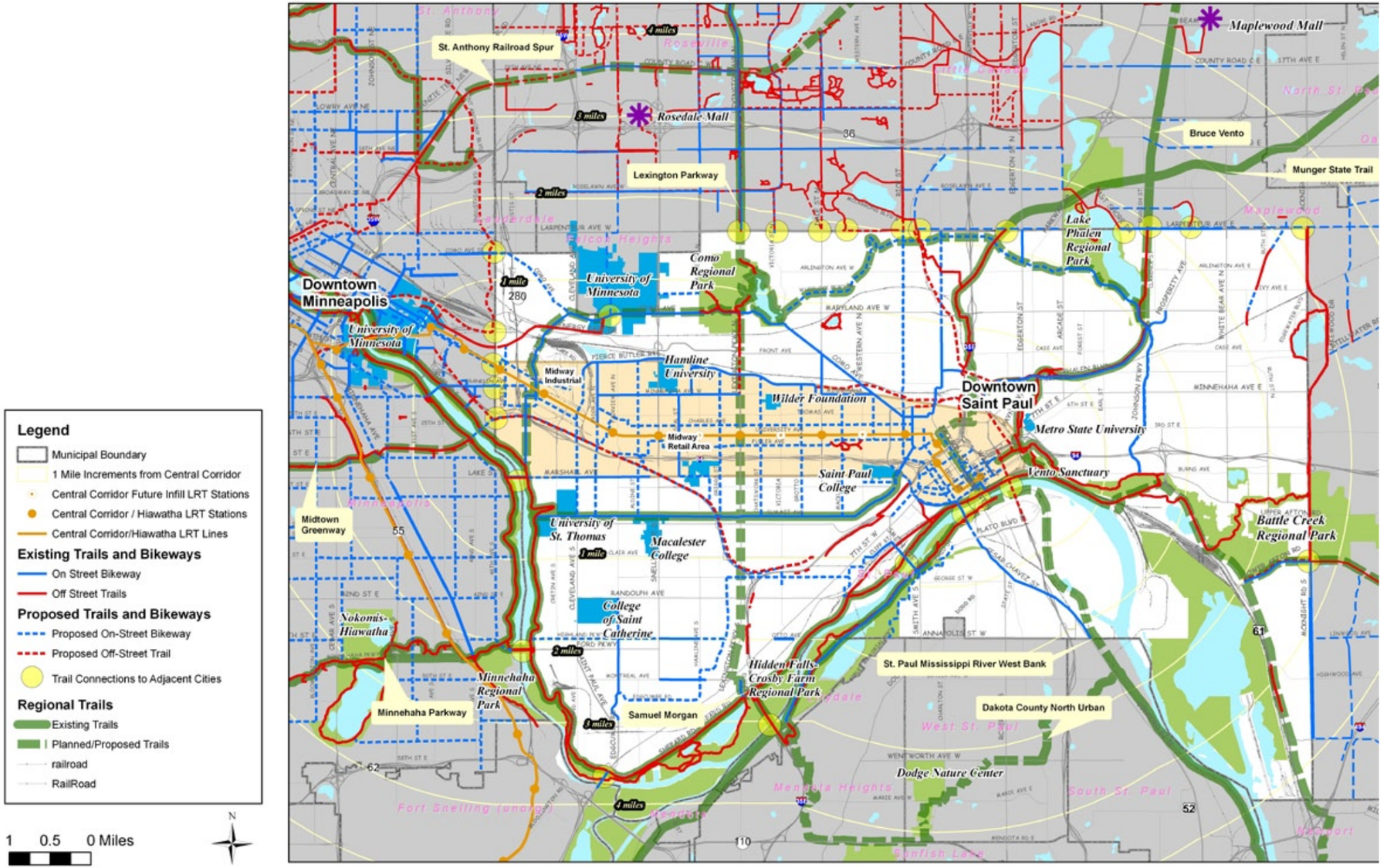
The character of the downtown Saint Paul is distinctly different from the University Avenue area. While both areas are fully developed urban environments, downtown has much greater density and more employment and regional destinations. University Avenue is predominantly a lower density commercial corridor bordered primarily by single family residential housing. Schools, parks, community centers and smaller retail areas are located throughout the Corridor. Residential neighborhoods extend north and south of University Avenue in a regular grid pattern of streets. Major streets such as Rice, Dale, Lexington, Snelling, Cleveland and TH 280 cross University Avenue at approximately one mile intervals. North-south traffic tends to concentrate on the streets that have interchanges with Interstate 94. A series of pedestrian/bike bridges also cross over I-94.

Several railroad lines are located within the corridor. Rail lines create barriers to bike and pedestrian movement, but rail corridors could offer an opportunity for a new off-road multi-use trails to be located within excess railroad right of way.

Did you know?

- Over 25 percent of trips are less than one mile, an easy 15 minute walk. About 40 percent of all trips are shorter than two miles-a 30-minute walk or a 10-minute bike ride.
- One in 12 U.S. households does not own an automobile (2001 NHTS).
- Motor vehicle emissions represent 31 percent of total carbon dioxide, 81 percent of carbon monoxide, and 49 percent of nitrogen oxides released in the U.S. (The Green Commuter, A Publication of the Clean Air Council).
- The cost of operating a car for one year is approximately $8,000. (AAA, Your Driving Costs).
- According to 2004 data from AAA estimates and US Census surveys, ownership of one motor vehicle accounts for more than 18 percent of a typical household's income.

Figure 2.1 Corridor Context with Bikeways



Goals & Objectives

The goal of the Central Corridor Bike-Walk Action Plan is to enhance biking and walking to and within the Central Corridor and foster bicycling and walking as a major portion of the transportation solution. The Plan will achieve this goal of **increasing biking and walking travel mode share in the Central Corridor** by focusing on five objectives - Improving Connectivity, Enhancing Safety, Improving the Bike-Walk Experience, Fostering Creative Solutions and assuring Feasibility/Functionality. The criteria listed under each objective help define the objective's intent. Objectives help select and prioritize routes, improvements, support facilities, amenities and programs.

1. Improves Connectivity (bike/walk routes)

- Connects to LRT stations
- Connects to destinations (workplaces, commercial centers, residences, schools, recreation centers, libraries, regional trails and parks)
- Closes existing gaps
- Creates direct, legible and visible connections
- Connects young people to education opportunities
- Connects underserved areas of the City
- Connects populations with low mobility (low rates of car ownership, seniors, youth)

2. Enhances Safety

- Minimizes conflicts with other travel modes (i.e. for on-street bikeways: adequate space, lower speed, lower average daily trips (ADT), low truck/bus use, avoids conflict with loading & unloading uses, recognizes space for snow storage, has minimal curb cuts, etc.)
- Has safe crossings or improves crossing safety
- Enhances bike and walk safety through improved lighting, enhanced visibility, activity, etc.

3. Improves the Bike/Walk Experience

- Reduces barriers to biking or walking
- Creates a comfortable/pleasant environment – aesthetics, traffic, buffering, noise, shelter, seating, etc.
- Has a year round benefit
- Has minimal stops/intersections
- Improves travel time

4. Fosters Creative Solutions

- Demonstrates an innovate approach
- Has potential for corridor-wide use
- Has community support
- Has positive environmental impact
- Enhances community livability and sustainability
- Enhances economic development (neighborhoods, streets, businesses)
- Will attract new transit riders
- Raises awareness of bike/walk opportunities and benefits

5. Is Functional and Feasible

- Has funding potential
- Has reasonable timing for implementation
- Is cost effective (initial and life-cycle costs)
- Meets applicable engineering standards
- Maximizes the mode share shift to bike/walk
- Maximizes efficient use of existing facilities
- Has a reasonable grade/slope for most users
- Accommodates a range of walkers and cyclists (multiple ability levels)

Existing Bike-Walk Conditions

Non-motorized movement is a key attribute to a successful and vibrant city. Walkable, bikeable cities are becoming a hallmark of a desirable place to live and visit. Everyone is a pedestrian, whether our trip starts by car, transit, or bike - we walk to complete the trip. In walkable neighborhoods, errands can be done on foot and walking for recreation and exercise is fun. Whether to save money, for personal health or because of the environmental benefits, more and more people are leaving their cars at home and taking their bikes or heading out on foot.

Overall, the outlook is good for the future of walking and biking in Saint Paul. Though there are a few challenges, the regular street grid with existing sidewalks provides a sound foundation for pedestrian movement. Existing conditions for biking are less established. Few bikeways exist within the Central Corridor. Traffic volumes and speeds hinder bicycling and walking on major roads. The good news is that the grid street pattern offers many bike route choices and many trips can be made on low-traffic residential streets. The City has also recently stepped-up its efforts to improve biking and has outlined future trails in its new Comprehensive Plan. A bike network for the Central Corridor is identified in the Central Corridor Development Strategy and biking downtown has been addressed in the Downtown Bicycle Transportation Plan.

Existing Walk Conditions

4

For evaluation purposes, streets can be categorizied as pedestrian friendly, pedestrian tolerant or pedestrian intolerant. Pedestrian friendly streets provide a safe environment and a pleasant walking experience due to the presence of ample walkways, pedestrian scale lighting, street trees and landscaping, decorative paving and benches. Pedestrian tolerant streets make for safe walking with sidewalks and lighting, but facilities are utilitarian. Pedestrian intolerant places lack sidewalks, lighting and feel unsafe. Pedestrian places are a fourth category and include exceptional outdoor places with high-quality amenities such as parks, plazas and dining areas and supporting land uses such as retail and restaurants that draw people and create a vibrant atmosphere.

The residential neighborhoods in the Central Corridor are, generally, pedestrian friendly. In most places there are sidewalks and grassy, tree-lined boulevards the buffer walkers from the street and provide shade in the summer months. Likewise, the Capitol area has pedestrian amenities, and expanses of green lawn and high quality landscaping make the area park-like and pleasant for pedestrians, but the area lacks the density of activity to make it a vibrant place.

The commercial areas on and surrounding University Avenue, are pedestrian tolerant – you can walk on a sidewalk to get to your destination, but the experience is not made more pleasant by the attributes of the streetscape (landscaping, wide walkways, seating, lighting, wayfinding signage and outdoor social spaces). The intersections and street crossings accommodate pedestrians, but do not welcome them. Some people feel that University Avenue and major intersections like University and Snelling Avenue are unsuitable for pedestrians due to high traffic volumes and unsafe pedestrian crossing conditions.

There are areas in the corridor that are pedestrian intolerant. The area west of Prior Avenue has few sidewalks and an irregular street pattern, making walking challenging and unpleasant. The Midway shopping district is another pedestrian intolerant area. The automobile-dominated businesses on the south side of University Avenue have vast expanses of parking and there are few direct walkways from University Avenue to businesses. In addition, because businesses are inwardly oriented, sidewalks on surrounding streets are neglected and the absence of active land uses makes them feel unsafe.

The vehicle bridges and underpasses across I-94 and TH 280 can be a hostile environment for pedestrians. While the bridges have walkways, there is no separation from four to eight lanes of traffic and crossing freeway on- and off- ramps is problematic.

Pedestrian bridge crossings over I-94 also need improvement. While regular non-vehicular crossings are great links between University Avenue and the neighborhoods to the south, pedestrian/bicyclist-only bridges have approaches obscured by landscaping, inadequate lighting and chain link fencing, all of which make them feel unsafe to pedestrians, particularly at night.

In downtown, pedestrian conditions range from exceptional pedestrian places to pedestrian tolerant. Downtown has short square blocks and a complete sidewalk network which makes it very walkable. The Rice Park area is an exceptional pedestrian place. Streets around Rice Park have high quality sidewalks with pleasant green streetscapes and restaurant seating that contributes to outdoor sidewalk life. Lowertown is also pedestrian friendly with streets framed by historic buildings, well-kept sidewalks, pedestrian scale lighting and outdoor destinations such as the Farmers Market and Mears Park which teem with people on pleasant days.

The dowtown area between Rice Park and Lowertown is merely pedestrian tolerant. While sidewalks and short blocks make pedestrian movement possible, the absence of street trees, pedestrian scale lighting, and street-level retail make walking trips in this area more utilitarian. Fifth

Caption

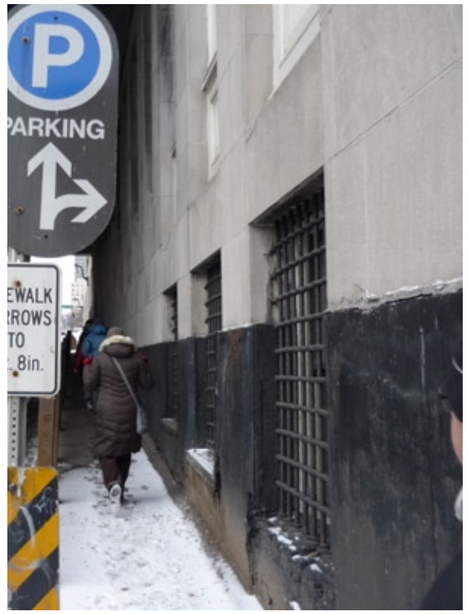
and Sixth Streets are major bus routes and have high pedestrian use, but they have insufficient sidewalk space on the bus-stop side of the street and, overall, lack the charm that comes from pedestrian amenities and supporting land uses.

The skyway system is another layer of pedestrian movement in downtown. This system makes pedestrian movement in the cold winter months pleasant, but draws restaurant and retail uses, which are keys to creating vibrant pedestrian places, to the second level, leaving the streets vacant. The area between Rice Park and Lowertown, where the skyway is most developed and functions best, is also where the downtown street-level pedestrian environment is the least vibrant. Because the skyway system does not follow the street grid and access is hidden inside buildings, it is also difficult to move between the street and the skyway, and once in the skyway it is easy to get disoriented.

A few areas in downtown are pedestrian intolerant. Sibley, from Kellogg to the Sam Morgan trail, has a high quality sidewalk with an engaging pavement pattern leading to the river, but the railroad underpass has inadequate lighting and feels unsafe.

Table 4.1 Pedestrian Friendliness Summary

	West of Prior	East of Prior	Down-town	Rail Crossings	Highway Crossings
Intolerant	●			●	
Tolerant		●	●		●
Friendly			●		
Pedestrian Place			●		

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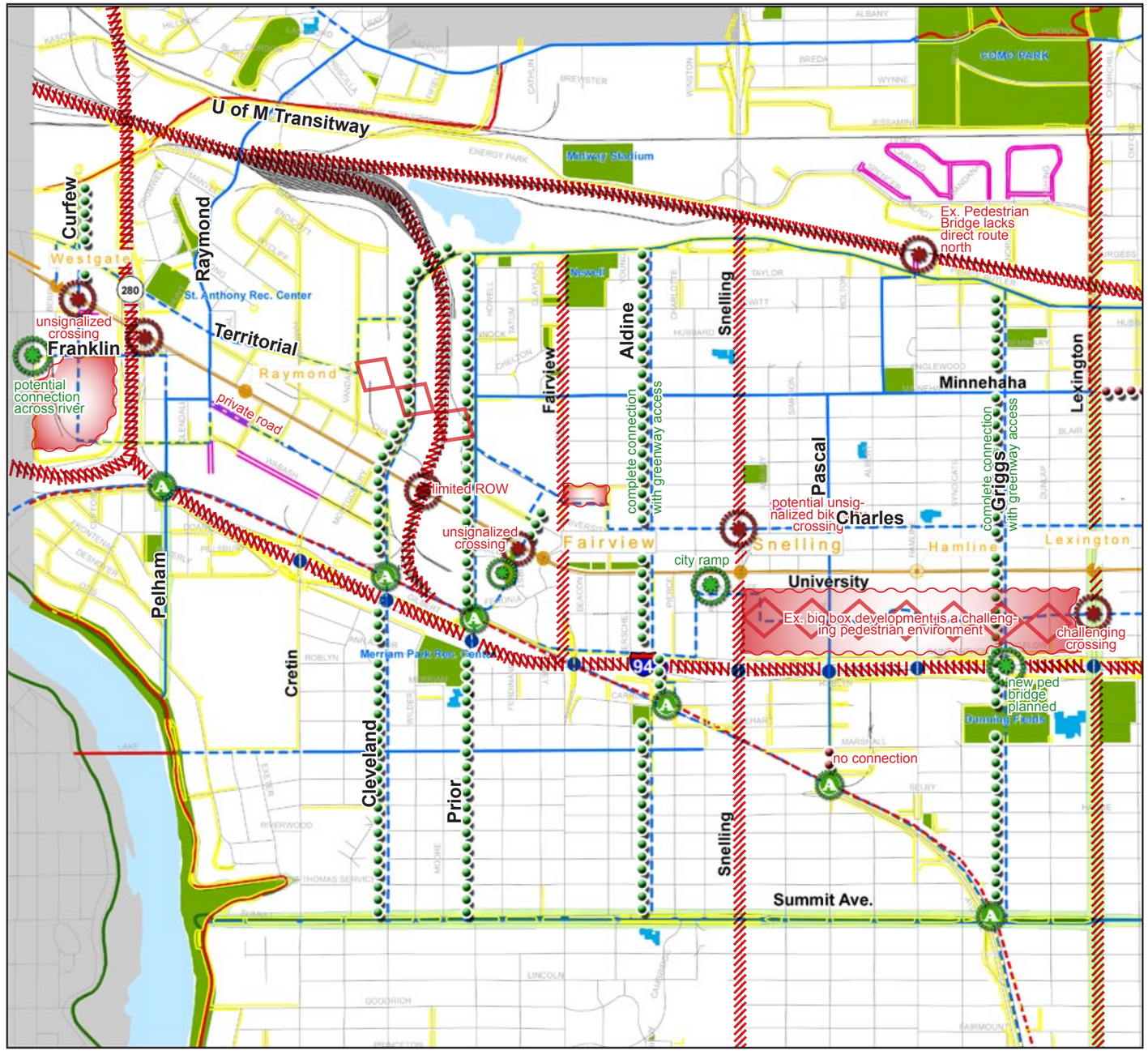
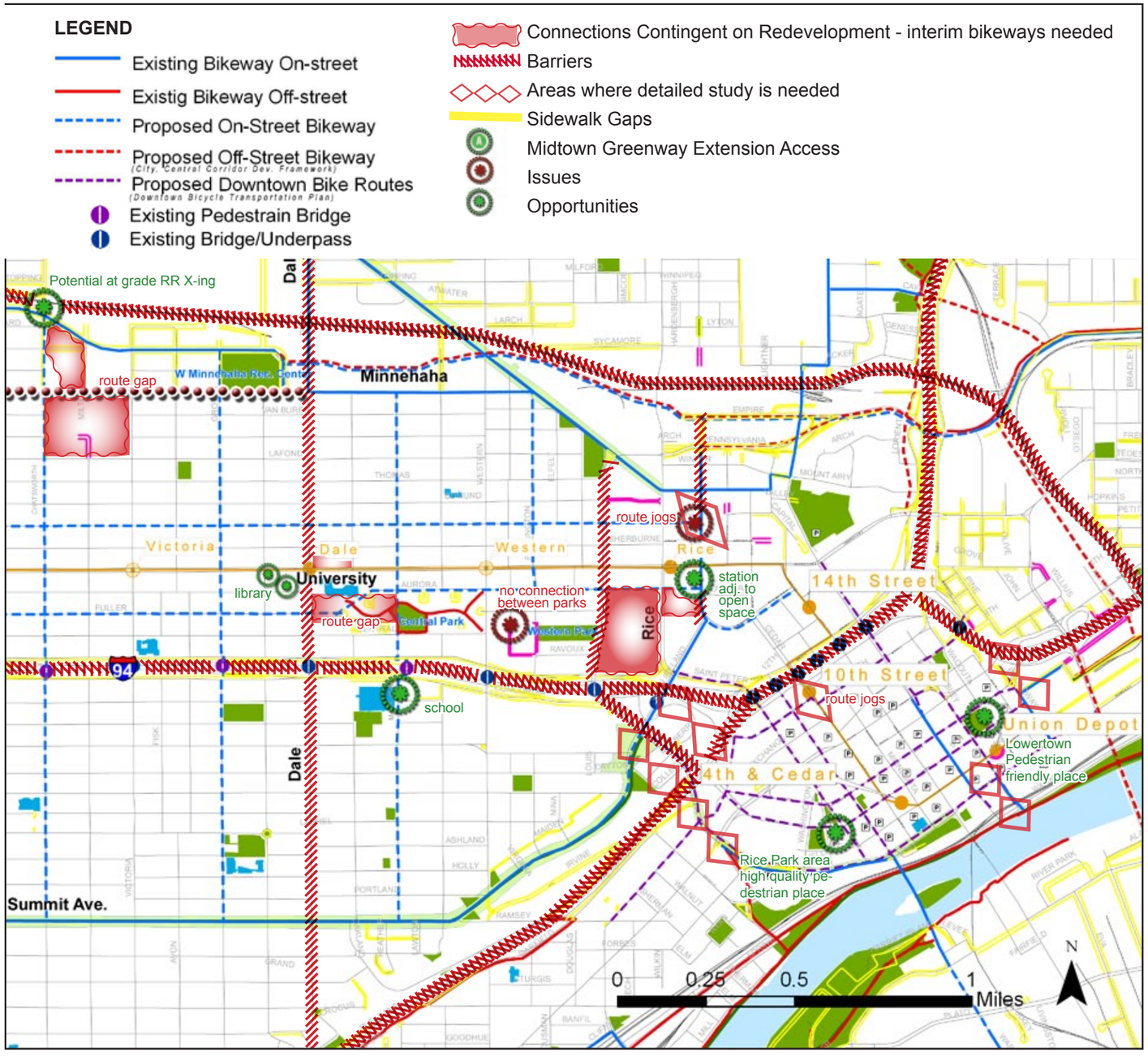
Bike-Walk Issues and Opportunities

4

Though there are sidewalks in most places in the Central Corridor, making it pedestrian friendly, the Corridor lacks amenities found in pedestrian friendly places
Caption

Figure 4.1 Bike-Walk Issues and Opportunities




LEGEND
Existing Bikeway On-street
Existig Bikeway Off-street
Proposed On-Street Bikeway
Proposed Off-Street Bikeway
(City, Central Corridor Dev. Framework)
Proposed Downtown Bike Routes
(Downtown Bicycle Transportation Plan)
Existing Pedestrain Bridge
Existing Bridge/Underpass
Connections Contingent on Redevelopment - interim bikeways needed
Barriers
Areas where detailed study is needed
Sidewalk Gaps
Midtown Greenway Extension Access
Issues
Opportunities
Potential at grade RR X-ing
route gap
W Minnehaha Rec. Cent
Minnehaha
route jogs
Victoria
Dale
Western
University
library
no connection between parks
route gap
Central Park
Western Park
Rice
station adj. to open space
14th Street
10th Street
route jogs
Union Depot
Lowertown Pedestrian friendly place
4th & Cedar
school
Rice Park area high quality pe-destrian place
Summit Ave.
0
0.25
0.5
1
Miles
N

Caption

Existing Bike Conditions

Bicycle conditions can also be categorized as bike friendly, bike tolerant or bike intolerant. Bike friendly streets have low vehicle traffic volumes and appropriate facilities that make biking enjoyable for all levels of cyclists, are connected to a larger system and have a high level of amenities such as landscaping, bike route signage and resting places. They frequently have designated space for bicycle travel such as a trail or bike lanes. Bike-tolerant streets have facilities that make biking safe, but lack the amenities of bike friendly streets. Bike-intolerant streets are automobile dominated, such that biking is daunting for all but the most experienced and dedicated cyclists. Intolerant streets typically have higher traffic volumes, more truck use and insufficient room for bicyclists.

There is a noticeable lack of bike facilities within the Central Corridor and legible, continuous routes are rare. There are established bike routes at the edges of the corridor that can be rated as bike friendly: Summit Avenue to the south; Como Avenue and the University Transit-way to the north; and Pelham/Raymond to the west. Regional trails such as the Bruce Vento Trail, the William Munger Trail and the Sam Morgan Trail lead to, but do not travel through downtown or the Central Corridor. Some of these bikeways, such as, Pelham/Raymond, alternate between striped bike lanes and a share-the-road route which is confusing for both cyclists and motorists.

Within the Central Corridor, conditions range from bike tolerant to bike intolerant. In general, the grid street pattern and quiet, low-traffic residential streets are bike friendly. Bike lanes exist on portions of Prior, Pascal, Minnehaha, Marshall and Dale, but overall these segments lack continuity and connectivity with city-wide routes. On major streets

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biking conditions are intolerant. University Avenue is generally intolerant to bicyclists due to its higher traffic volumes, frequent driveway and local street access, and variable width, but it is used by cyclists since it is one of the few east-west routes through the city. Pierce Butler is a designated route with wide, striped shoulders, but as a truck route with a posted speed limit of 40 miles per hour, and no pavement markings specifically identifying a bike lane, it can be frightening to even seasoned bikers. Similarly, biking on high traffic streets such as Snelling, Dale and Rice is out of the question for many cyclists. The existing bike/pedestrian bridges over I-94 provide traffic-separated crossings of the highway, but in some cases have difficult approaches and access.

The presence of support facilities, such as secure bike parking, can be rated as intolerant in the Central Corridor. Though there are bike racks and lockers, these are not always in visible places and more facilities would encourage more biking.

In downtown, biking conditions can be described as intolerant. Bike lanes are provided on portions of Sibley Street and Jackson Street, presumably to get bikers to and from the river, but these lanes stop and start unpredictably. Jackson is particularly dangerous as the bike lane terminates, leaving bikers to navigate down a steep hill on their own, through a tunnel to the Sam Morgan Trail along the Mississippi River. Downtown bike lanes are disconnected and illegible. In addition, regional bikeways in all directions (the Bruce Vento Trail, Summit Avenue and John Ireland Boulevard Bikeway, the Sam Morgan Trail) all lead to downtown, but lack continuity through downtown. In 2005 only 0.5% of trips in downtown Saint Paul were made by bicycle, compared to +2.5% in Minneapolis, where a stronger network of bike facilities exist. Connecting the Central Corridor to greater Saint Paul, Minneapolis and the region is challenging due to significant highway and railroad barriers. Barriers, depicted in Figure 4.1, include:

» **The railroad and industrial corridor north of Pierce Butler** - All crossings of this corridor pose challenges: Raymond travels under a narrow rail trestle; Snelling, Lexington and Dale are busy roads without existing bicycle facilities; and an existing pedestrian-bike bridge at Hamline connects Pierce Butler Route to Energy Park Drive, but does not extend connectivity north across the second railroad barrier to the southwest corner of Como Park.

» **The rail corridor between Cleveland and Prior** - North of I-94, the only routes across this are Pierce Butler, and University Avenue.

» **I-94** ia a barrier to north-south movement throughout the corridor. Though there are bridges across the highway roughly every 1/4 mile, vehicular bridges do not provide specifically for cyclists and the pedestrian/bike bridges do not feel safe due to poor lighting and approaches that are obscured by overgrown vegetation.

» **Downtown, I-94 and I-35E** form the northern edge of downtown and limit options for cyclist movement in and out of downtown, particularly from the west, where almost all non-highway traffic is funneled to Kellogg Blvd.

» **The Mississippi River and Ramsey Hill** also limit access to downtown from the west and south.

In spite of significant barriers, there are opportunities to provide connections within Saint Paul's, as well as to surrounding communities. Today, connections to Minneapolis are possible via the University of Minnesota Transit-way off of Raymond. Long-term, there is the opportunity to link Minneapolis' Midtown Greenway with Saint Paul's planned Midtown Greenway Extension with a bridge across the Mississippi River. There is also the opportunity to connect the planned trail along the future Granary Road in Minneapolis to Pierce Butler in Saint Paul via a northern greenway route. Realizing this link would create a continuous bike connection from the Stone Arch Bridge in Minneapolis to the William Munger State Trail in St. Paul to Stillwater.

To address regional connectivity to the north, Lexington Parkway has been identified by the Metropolitan Council in the Regional Park System Plan as a regional trail corridor. Much of this trail corridor north of Como Park is complete, but space constraints make realizing the trail south of Como Park very difficult. There may be opportunities to route this regional bikeway parallel to Lexington Parkway on Griggs Street or Chatsworth Street. On Chatsworth, there is currently an "unofficial" at-grade railroad crossing and the feasibility of formalizing this should be explored.

Though there are few existing bikeways, recent planning efforts have identified future bikeway networks for the Central Corridor and downtown. These routes, shown in Figure 4.1, are a combination of bikeways proposed in the Comprehensive Plan Transportation and Parks Chapters, the University Avenue Station Area Plans, the Central Corridor Development Strategy, and the Downtown Bicycle Transportation Plan.

	Major Streets	Minor Streets	Residential Streets	Access to Bikeways	Presence of Wayfinding & Route Marking	Presence of Support Facilities
Intolerant	●			●	●	●
Tolerant		●	●	●	●	
Friendly			●			

Table 4.2 Bike Friendliness Summary

Foundation Plans

4

City Planned Bikeways

The City of Saint Paul has plans for several city-wide off-road trails that are within the Corridor or connect it to the greater city. These are in various states of planning and most are long-term endeavors. However, when complete, they will be significant assets for Saint Paul. These trail projects are:

- **Canadian Pacific - Midtown Greenway Extension** - This planned off-road trail would follow the Canadian Pacific railroad corridor from the Minneapolis border east to connect to a future off road trail to be built on Ayd Mill Road. The Ayd Mill road portion of the trail will be the first to be built. The City is actively planning and designing this road extension.
- **Pierce Butler Extension** - Conceptual plans exist for extending the Pierce Butler Route east to Phalen Boulevard. An off-road bike trail and on-road bike lanes are planned for this trail.
- **Kitson Connection/Trout Brook Parkway** -This conceptual trail alignment will connect the Bruce Vento Trail east of downtown north to Phalen Blvd.
- **Layfayette Bridge Upgrade** - When the Lafayette Bridge is rebuilt, a bikeway will connect downtown to neighborhoods across the Mississippi River.

Central Corridor Development Strategy

Bikeway routes suggested as part of Central Corridor Development Strategy would create a grid of bikeways occurring every ½ mile, typically on streets ¼ mile from the LRT Stations. For the most part, bikeways are suggested for local streets with low traffic levels and existing crossings of 1-94. Since bike lanes will not be accommodated on University Avenue, due to space constraints, two parallel routes are suggested, one to the north on Charles Avenue and one to the south on Fuller/Aurora. Bicyclists will likely still ride on University to reach many destination along it, but will do so by riding in a standard traffic lane.

Planned Bikeway Strengths

- The east-west and north-south bikeway grid allows for continuous movement in the Corridor and easy access throughout the Corridor.
- The network is predominantly on local streets with low traffic levels, minimizing potential conflicts between cars and cyclists.
- North-south routes align with planned signalized crossings at University and existing crossings of I-94. The Westgate Station area is the exception to this, where the route through controlled intersections from the University Transitway to the crossing of I-94 on Pelham is more circuitous.
- Extension of the north-south bikeways south to the planned Midtown Greenway Extension and Summit Avenue will link the Central Corridor to the southwestern part of the city. Particularly important are bikeways that connect the Corridor to Summit, the Midtown Greenway Extension and Pierce Butler.

Caption

Planned Bikeway Challenges

- Un-signalized intersections across arterial streets, particularly Snelling Avenue, Lexington Parkway, Dale Street, Marion Parkway, and Rice Street all act as major barriers to east-west movement on Charles Avenue and Fuller/Aurora Avenues (Figure 4.1).
- Key segments of the suggested routes depend on redevelopment for completion, so some of the routes will be long-term endeavors. This is particularly true for east-west movement south of University on Fuller and Aurora. Bikeways dependent on redevelopment areas are highlighted on the issues and opportunities map.
- Because of irregular street patterns and barriers west of Fairview Avenue, routes are indirect and involve many turns.
- East-west connections to downtown are challenging to make due to the street network, one way streets, the LRT route, and topography.
- While the proposed network provides for regular and direct movement within the corridor, the routes do not intersect directly with most of the LRT stations.

Downtown Bikeway Plan

Downtown, bikeways are suggested to provide north/south and east-through movement. Entry/exit downtown from the west is suggested on Kellogg and 12th Street to the west; Wabasha Street to cross the river; Jackson to the north and 9th Street and the Bruce Vento Trail from the West.

Planned Bikeway Strengths

- The proposed bikeway grid provides bikeway access to all downtown areas.
- Jackson Street/Sibley Street provides connections between the Sam Morgan Trail, planned city bikeways on Wheelock Parkway (part of the Saint Paul Grand Rounds) and the William Munger Trail.

Planned Bikeway Challenges

- Kellogg carries particularly high traffic volumes and is a major vehicular route with entrances to I-35E and I-94.
- At the edges of downtown, streets that feed highway on-off ramps have dangerous intersections for bikers, particularly the 6th Street and Broadway intersection, 10th Street at the History Center and 12th Street just north of downtown.
- On many streets there are space constraints and dedicated bike lanes cannot be easily accommodated without reducing travel lane widths, eliminating travel lanes, or eliminating on-street parking. Bus lanes are also already present on several major streets.
- The northern east-west bikeway jogs between 9th and 10th Streets at Cedar Street. When LRT is built, the 10th Street LRT station platform will not allow for two-way bike movement across this intersection.
- Jackson Street between Kellogg and the Sam Morgan Trail is a particularly dangerous connection due to the hill down to the river, bridge under the rail yards, and intersection design at Shepard/Warner Road.

Caption

Bike Plan

The Bikeway Plan is designed to create a bike friendly environment within the Central Corridor. It includes a Bike Framework with recommended bikeway routes, and recommendations for traffic calming, wayfinding and bike parking and storage.

The Bike Framework recommends a series of new regional, commuter and local bikeways to create a comprehensive, connected network within the Central Corridor. The bikeway recommendations rely primarily on capturing space within existing lower volume streets to add bike lanes and to create shared bike-vehicle routes. Planned off-street multi-use trails along the Midtown Greenway Extension would supplement the recommended on-street bikeways. Recommendations are provided for bikeway connections to LRT stations, crossings of major streets and for the downtown area.

In addition to bikeway routes, the Plan includes recommendations for traffic calming measures and safety improvements to slow traffic, and make streets safer and more comfortable for bicyclists and walkers.

Bike wayfinding recommendations are designed to create a comprehensive set of bike route signs, pavement markings, maps and digital route-finding tools to direct cyclists to their destination and to alert motorists to the presence of bikers on the street.

The Plan includes recommendations for trip end facilities which consist of bike storage strategies and recommended locations for bike stations and bike parking.

Bikeway Framework

Regional bikeways

- Regional routes make connections to or are part of city-wide or regional bikeway system
- Routes accommodate all users from experienced to novice
- Routes have shared transportation and recreation functions
- Routes connect cities and to major City and regional destinations and to commuter and local bikeways
- Focus is on safety, user experience, improved travel time and route continuity
- All routes have a vehicle free designated bike zone –bike lanes and/or off road trails
- There is significant investment in landscaping, way finding and amenities
- Bikers given priority at minor crossing (stop signs) and major intersections are signalized

Preferred Regional Bikeway Treatments

- Off-street Trails
- Dedicated Bike Lanes
- Traffic Calming
- Safe Crossings
- Signage & Markings
- Way Finding
- High Quality Amenities
- High Quality Landscaping

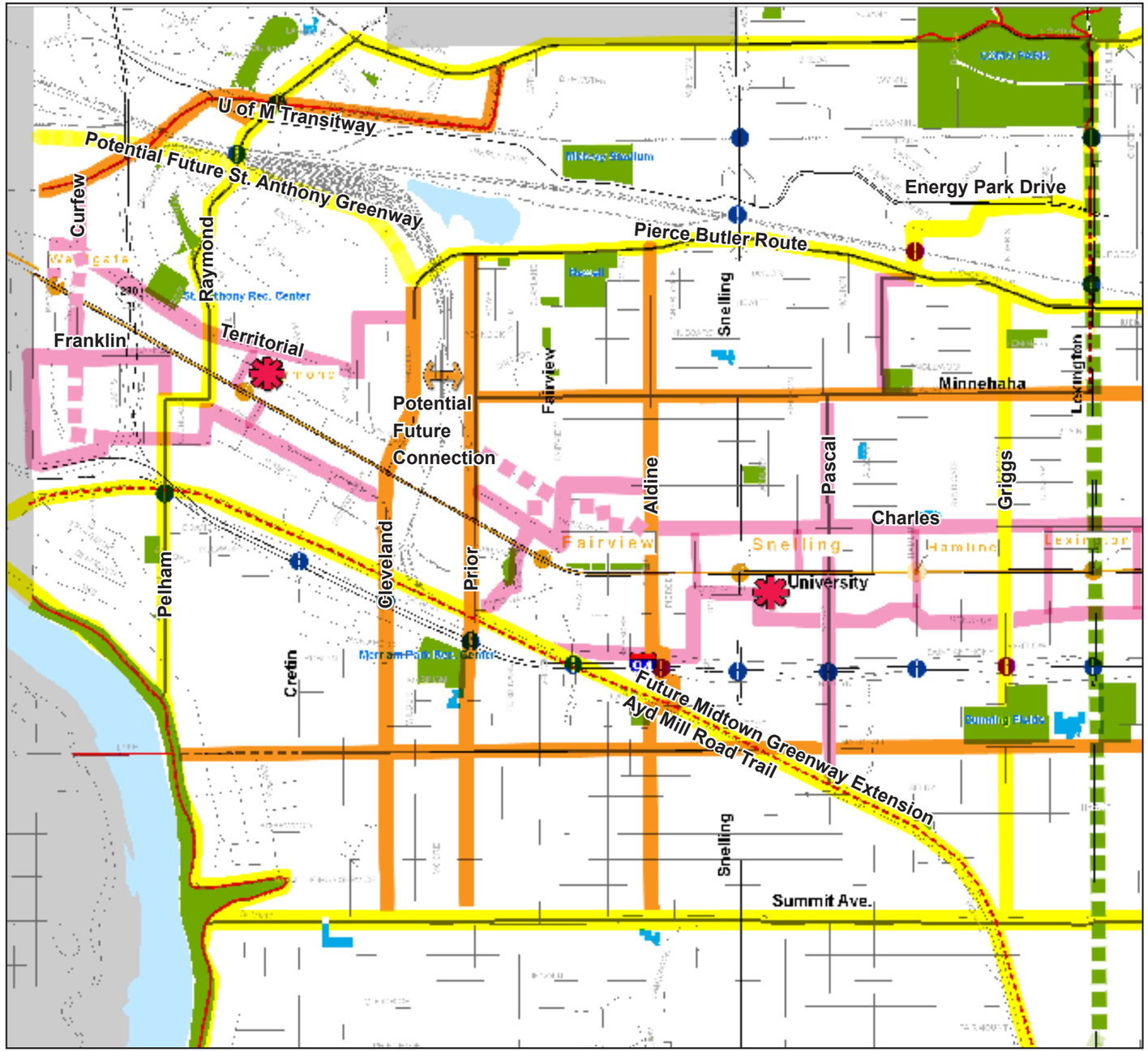
Off-street trail

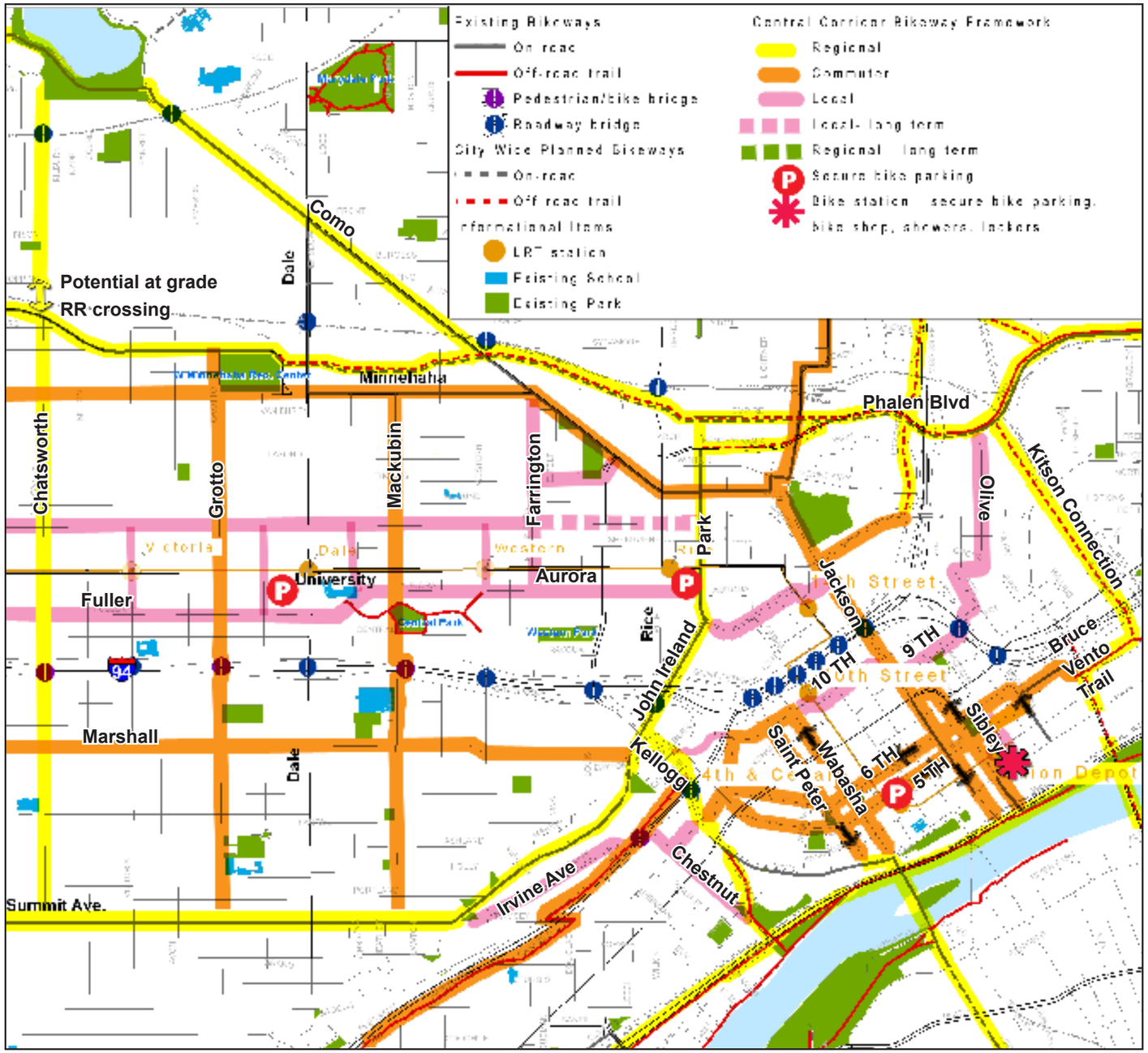
Dedicated bike lane

Commuter Bikeways

- Commuter routes are used to access the main routes and provide for continuous movement across barriers (highways, railroads, and major intersections) within the Central Corridor
- Routes focus on commuter movement – average to experienced riders
- Routes link residential areas to employment, shopping and transit
- Focus on route continuity, safety and way finding
- Ideal treatment is a vehicle free designated bike zone – bike lanes
- Bikers given priority at minor crossings (stop signs) and major intersections are signalized
- Biker movement and safety given priority over vehicle parking desires

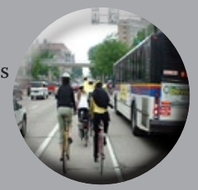
Figure 5.1: Bikeway Framework

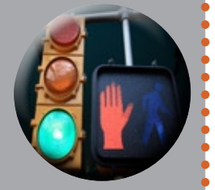




Preferred Commuter Bikeway Treatments

- Dedicated Bike Lanes
- Traffic Calming
- Safe Crossings
- Signage & Markings
- Bike Storage
- Personal Facilities
- Way Finding
- Amenities
- Landscaping


Dedicated bike lane


Signal crossings

Local Bikeways

- Local routes are for bikers going short distances between home, business, and transit stops and providing connections from Regional and Commuter routes to local destinations
- Routes accommodate experienced to average users
- Focus on traffic calming and way finding
- Routes have a shared vehicle/bike zone such as Bike Boulevard (shared bike and vehicular traffic) or sharrows markings/ pavement symbols
- Bikers given priority at minor crossings (stop signs) but may not have signals at major intersections. Goal of a "safe harbor" median area where local bikeway routes cross major streets. Explore use/need for advance crossing devices "HAWK" and others.
- Routes may jog and may not be continuous across highway barriers, again the focus is on short trips, not through movement

Preferred Local Bikeway Treatments

- Bicycle Boulevards
- Traffic Calming
- Safe Crossings
- Signage & Markings
- Bike Storage
- Way Finding
- Landscaping


Safe crossings


Bike boulevard

The bikeway framework combines routes suggested in the Central Corridor Development Strategy, the Saint Paul Downtown Bicycle Plan, and the City's Comprehensive Plan to create a cohesive network that connects the Central Corridor and downtown Saint Paul to the greater city and region. To this end, networks recommended in these plans have been adjusted to bridge gaps, create a comprehensive network and to address inherent challenges.

The bikeway framework, shown in Figure 5.1:

- Connects the Central Corridor to the greater city and the region;
- Facilitates east-west and north-south movement within the Corridor by creating a grid of bike routes not more than ½ mile apart;
- Provides fine-grained connections from the route network to LRT on local, low volume streets;
- Makes biking more accessible and safer for all levels of cyclists, from novice to expert by creating a legible system that incorporates a combination of trails and dedicated bike lanes on higher-traffic streets and bike-boulevards on lower volume, local streets.

The framework is based on a hierarchy of bike routes: regional, commuter, local routes and connectors, each with specific treatments that respond to route purpose, traffic conditions and available space. Recommended treatments are considered 'ideal'; flexibility will be needed to implement the plan due to variable conditions. What is essential is that all installed bikeways are continuous and that this continuity is clear to both cyclists and motorists.

A mix of dedicated bike lanes, sharrows (shared bike-vehicle streets), bike boulevards (low-volume residential streets) and a few new off-street multi-use trails are recommended. Since the Central Corridor is a developed urban setting, the primary bike facilities will be new striped bike lanes on existing streets or shared use of streets. The Plan relies on lower traffic volume streets to create north-south bikeway routes as alternatives to busy streets like Snelling Avenue, Lexington Avenue, Dale Street and Marion Street. East-west bikeway routes are proposed for Marshall Avenue, Minnehaha Avenue and Pierce Butler Route.

After the addition of LRT on University Avenue, the remaining street width will not allow sufficient room for dedicated bike facilities. Therefore, local east-west bike boulevards are proposed parallel to University on Charles Avenue and for Aurora/Fuller Avenues.

Regional Bikeways

Regional routes are proposed as the system's organizing structure and encircle the Corridor. They are to be part of the city-wide bikeway system and, as such, make connections to the city and region. Many of these routes, such as Raymond-Pelham are well known to cyclists and will benefit from future investments to transform them into the city's premier bikeways. Other routes, such as the Pierce Butler Route Extension, the Ayd Mill Road Trail - Midtown Greenway Extension and the Kittson Connection have long been envisioned in city plans.

A particular challenge in the Central Corridor is making connections to the north, due to the presence of railroad tracks. Raymond Avenue connects on the west side of the corridor and Jackson Street makes a north-south connection on the east side. Lexington Parkway has been identified by the Metropolitan Council in the *Regional Park System Plan* as a mid-corridor regional connection but, due to right-of-way constraints, extending the trail south of Como Park to Summit Avenue poses significant challenges. This plan recommends that, to make much-needed connections to the north, Griggs and Chatsworth be designed as bikeway alternatives to the Lexington route linking the Summit Avenue Bikeway, the planned Midtown Greenway Extension and Como Park. For the near term, the existing Lexington Parkway trail would connect to Griggs via Energy Park Drive, the existing Hamline pedestrian/cyclist bridge, and Pierce Butler *(see Bikeway Framework Map)*. The opportunity for an at-grade railroad crossing at Chatsworth should be explored. If this crossing can be achieved, Chatsworth could provide a direct connection from the Summit Avenue Bikeway to Como Park east of Lexington Parkway.

OFF-STREET TRAILS

Description:

An off-street trail is completely separated from the roadway. The Twin Cities has been nationally recognized by the American Planning Association (APA) for its extensive network of off-street trails. These routes have been known for their recreational purposes, but in recent years they've become increasingly popular for bicycle commuters. They offer safe, scenic and long-distance routes with little or no interaction with motor vehicles. Off-street trails also enhances the livability and walkability in our neighborhoods.

The challenge in implementing an off-street trail is defining its right-of-way. This process can be challenging at times and costly. It is especially challenging when working in built environments. It is unlikely large trail connections would be feasible in these environments. The planning process for off-street trails typically includes a more extensive planning process, which includes environmental documentation, defining a preferred alignment and a public process.

Off-street trails may also include way-finding sings, kiosks, water fountains, benches, lighting, landscaping and other amenities.

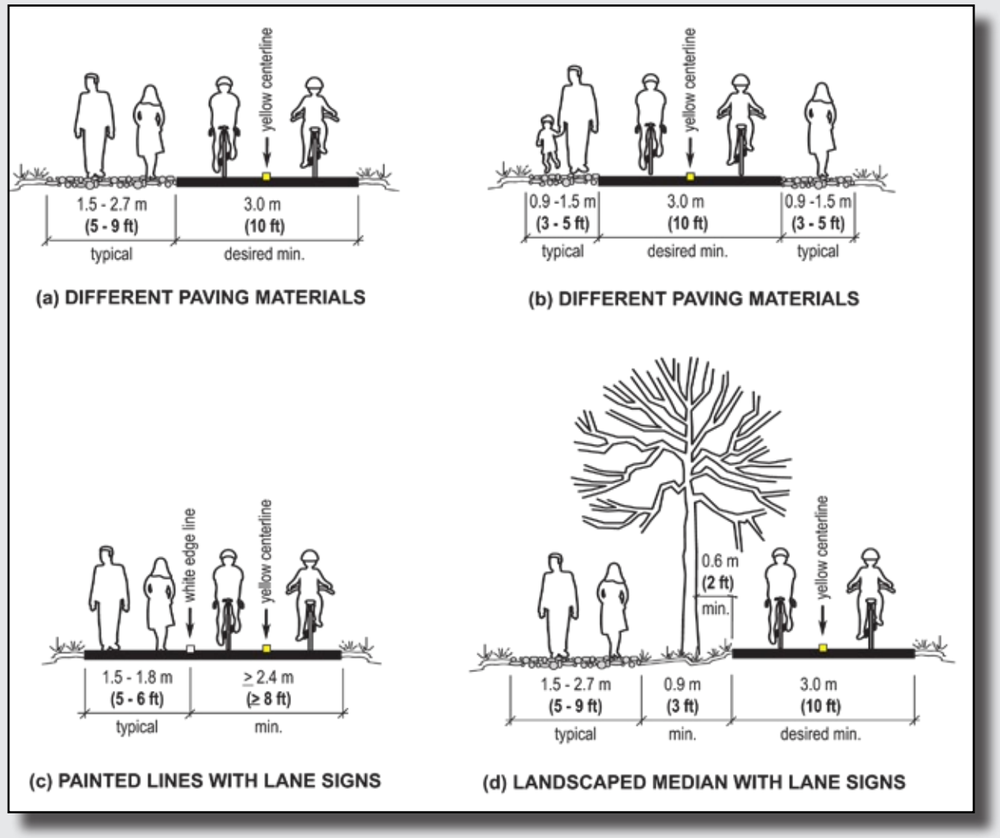
Typical Design Standards:

The width of an off-street trail ranges in right-of-way (4 – 10 feet) width, depending on the number of bike lanes and pedestrian ways. Off-street trails that are designed to accommodate bicyclists will need to be paved. A maintenance program should also be in place to ensure pavement upkeep, snow removal, brush/debris removal and general repairs to amenities.

The design process needs to takes into consideration the appropriate measures to document and mitigate environmental impacts. Off-street trail planning initiatives should consult the "Trail Planning, Design and Development Guidelines" prepared by the Minnesota Department of Natural Resources".

Precedents:

Typical cross section



Examples:

Grand Rounds - Minneapolis, MN

5

Commuter Bikeways

Commuter bikeways focus on movement though the Central Corridor, between regional bikeways. Routes form a ½ mile (roughly) grid, making all destinations a short trip from a commuter bikeway. North-south routes occur on low traffic local streets that, for the most part, travel along the sides of businesses and residences. This reduces need for on-street parking and offers the opportunity to restrict parking to one side of the street to make room for bike lanes in each direction. Where there are space constraints, a share-the-road treatment with sharrows pavement markings should be used to signal both cyclists and motorists of a continuous bikeway.

North-south connectivity across I-94 is accommodated on all commuter bikeways with a combination of pedestrian/cyclist bridges, vehicular bridges, and underpasses. Improved lighting, is recommended for all bridges. The pedestrian/cyclist bridges at Aldine, Grotto and Mackubin will benefit from more visible approaches, crosswalks at St. Anthony and Concordia, lighting, ornamental railings and, if rebuilt, increased width to better accommodate both bikers and pedestrians.

East-west commuter movement is recommended on Minnehaha Avenue and Marshall Avenue. Segments of both of these roads already have striped bike lanes. Recent improvements on Marshall are an excellent example of how an automobile-oriented roadway can be reconfigured to allow for bike lanes and, at the same time, improve conditions for motorists and pedestrians. Improvements, described in greater detail in Chapter X should continue to be made to create a continuous bikeway from the Mississippi River to John Ireland Boulevard.

Figure 5.3: Prior bikeway south of University Avenue - photo visualization before and after

DEDICATED BIKE LANES

Description:

A dedicated bike lane uses pavement markings and signage to indicate the bike lane is solely for bikers. Dedicated bike lanes can be designed to work in a variety of conditions. Dedicated bike lanes are commonly used in urban environments, where there is a higher demand for bicycle treatments. They also work well in environments where there are right-of-way constraints or on-street parking.

Contraflow is a similar method used to dedicate bicycle use to one lane. This type of treatment requires a small median separating the bicyclist from the motorist. This particular treatment is used in cases where traffic calming techniques are needed.

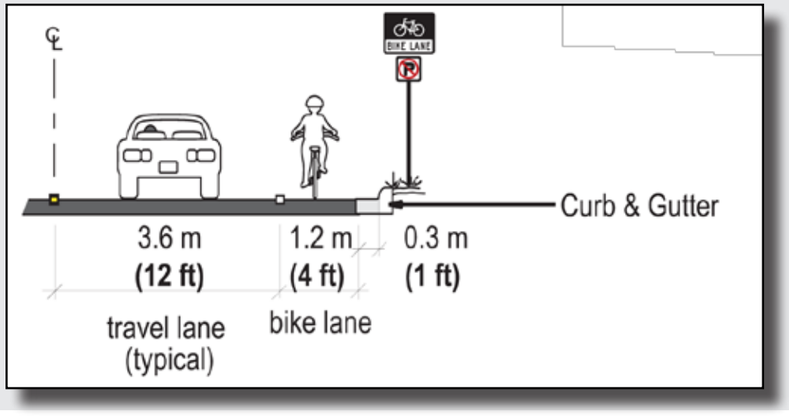
Typical Design Standards:

Dedicated bike lanes rely on pavement markings, striping and signage. Using a combination of these treatments increases the visibility and awareness that a bike lane is present. A dedicated bike lane sign will emphasis that the lane is solely to be used by bicyclists.

The pavement needed to accommodate a dedicated bike lane may range between 4 – 6 feet in width, depending on the traffic volume, available space, and presence of on-street parking.

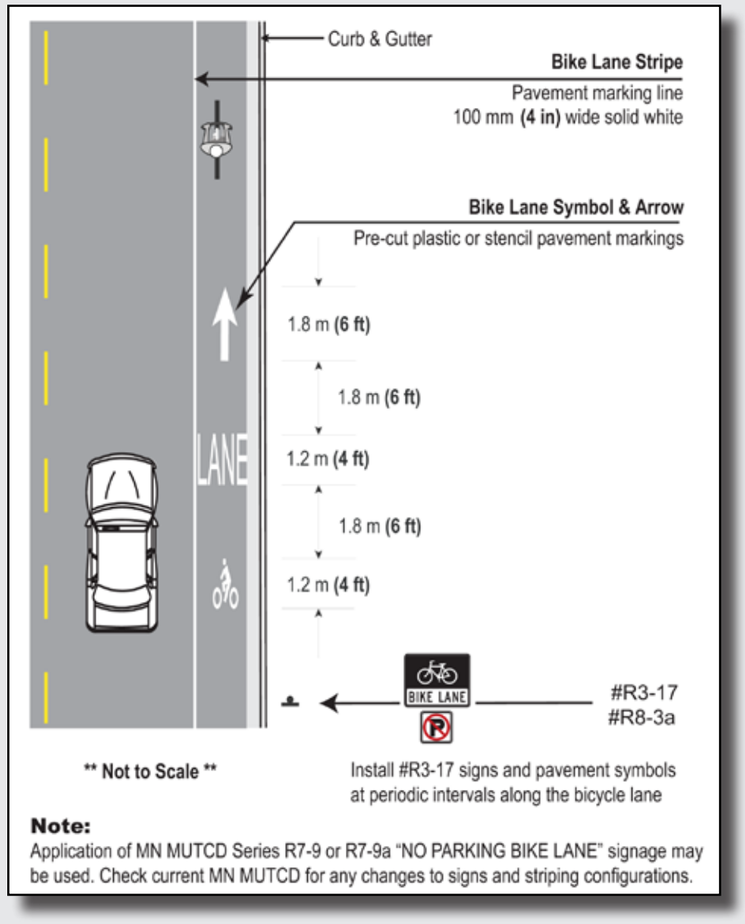
Implementing a contraflow treatment would require a larger roadway width, in addition to cost. However, the treatment has proven to be successful in communities such as Madison, Wisconsin and Portland Oregon.

Typical cross section



Precedents:

plan view



Examples:

SUMMIT AVENUE,
ST. PAUL, MN

DOWNTOWN,
MINNEAPOLIS, MN

PORTLAND AVE.,
MINNEAPOLIS, MN

PARK AVE.,
MINNEAPOLIS, MN

Local Bikeways

Local bikeways accommodate east-west movement parallel to University Avenue on low traffic streets and provide access to LRT station platforms, bicycle parking, and other destinations. Local routes are envisioned as bicycle boulevards, appropriate for all levels of riders. West of Cleveland, Territorial provides for movement north of University Avenue and Myrtle to the south. Because of an irregular street pattern, routes are indirect and, therefore, way-finding will be essential.

East of Prior, Charles Avenue will be the principal local bikeway parallel to and north of University Avenue. This bikeway is envisioned as a bike boulevard with sharrow pavement markings, traffic calming and enhanced landscaping. Where Charles intersects with commuter bikeways, a circular planting area in the center of the street will provide a colorful focal point, slow traffic, and signal motorists and cyclists of the intersection of two bikeway streets. Planted sidewalk bump-outs at these intersections and where Charles intersects with other local bikeways will also slow traffic, "green" the street, and reduce the crossing distance for pedestrians.

Parallel to University Avenue to the south, the principal local bikeway route would follow Aurora and Fuller Avenues. The segment on Fuller travels through the heart of the Midway commercial district. Since significant redevelopment is anticipated along this route, new roads should be constructed to accommodate bicycle boulevard treatments.

Since the focus of local routes is not on through movement, traffic signals will not be provided at major intersections. To facilitate east-west crossing at Fairview, Snelling, Lexington, Marion and Rice, a refuge median is to be placed in the center of the roadway and only right turn movements will be allowed. The minimum six foot wide medians provide a safe haven for bicyclists and pedestrians and allow them to cross half of the busy street at a time. On bike boulevards, left turns at the local street–major street intersection would be eliminated, further calming traffic and increasing crossing safety.

To get to University Avenue and the LRT Stations, local bikeways also connect Charles and Aurora/Fuller on streets that intersect with the ends of the station platforms. Bicycle parking will be located on these side streets as well. For future infill stations at Hamline, Victoria, and Western, bicycle access is suggested directly on these streets leading to the stations. Because these roads carry higher traffic volumes, the possibility of bike lanes should be explored when the infill stations are built.

Circular Plantings

Flower boxes or small landscaping islands can be implemented on local streets to reduce traffic speeds and create pedestrian friendly environments. In some respects they serve as mini-roundabouts, but do not require the level of traffic control or right-of-way need for a full roundabout. They are intended to facilitate traffic by reducing speeds and making motorists aware of their surrounding environments. They also serve as an aesthetic quality in beautifying neighborhoods.

Figure 5.3: Charles and Chatsworth -typical intersection of a commuter and local bikeway - before and after

Figure 5.X: Intersection Treatments for the Charles Avenue Bikeway

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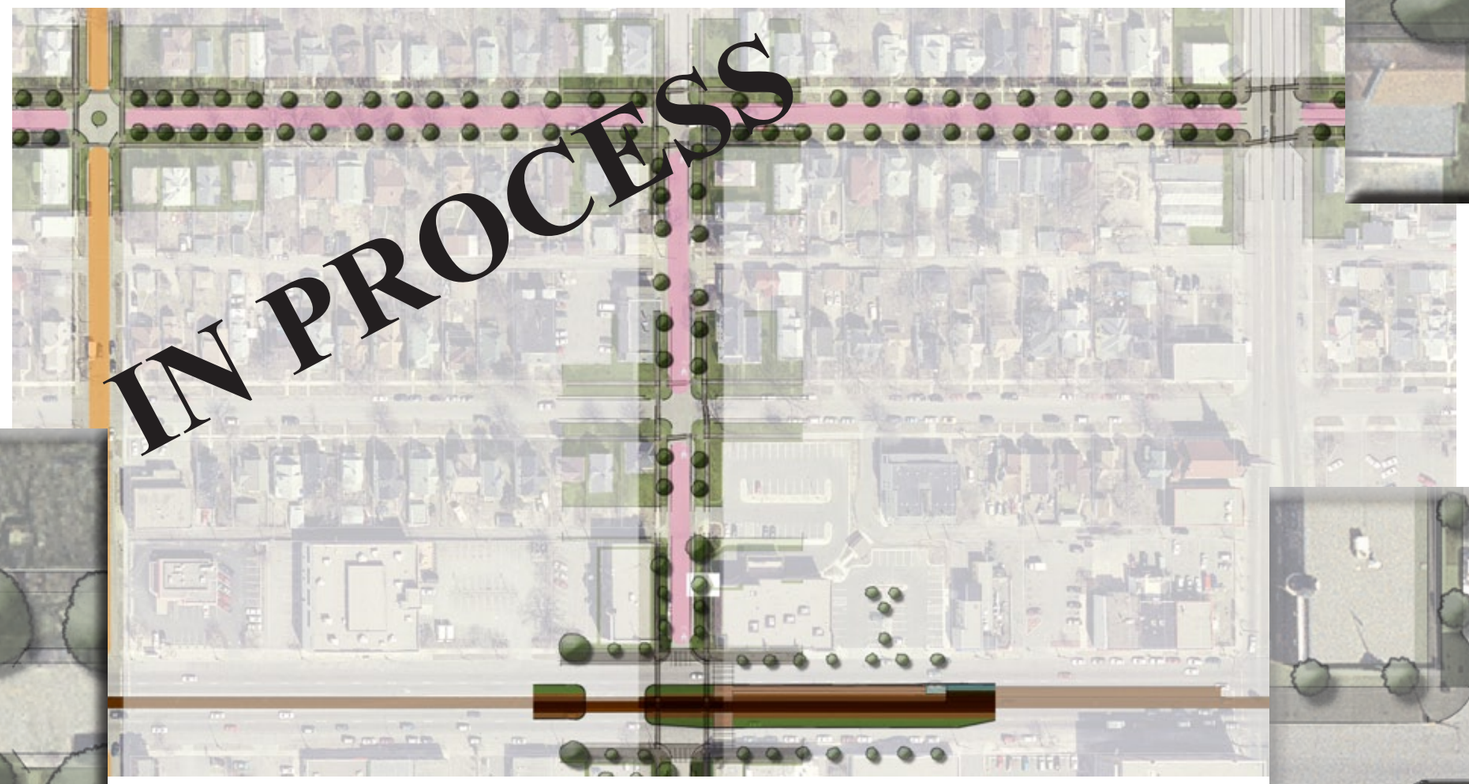
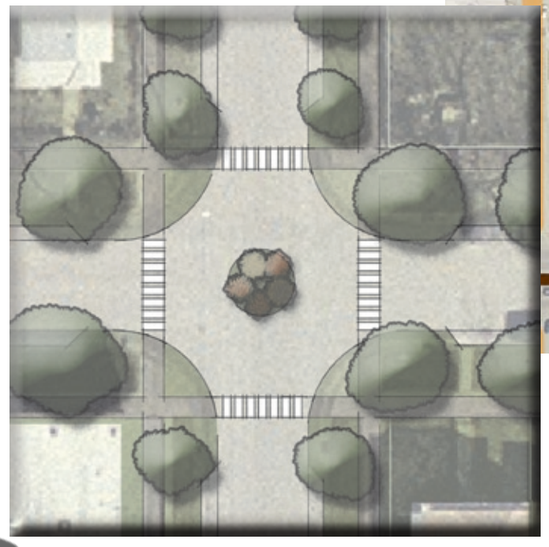
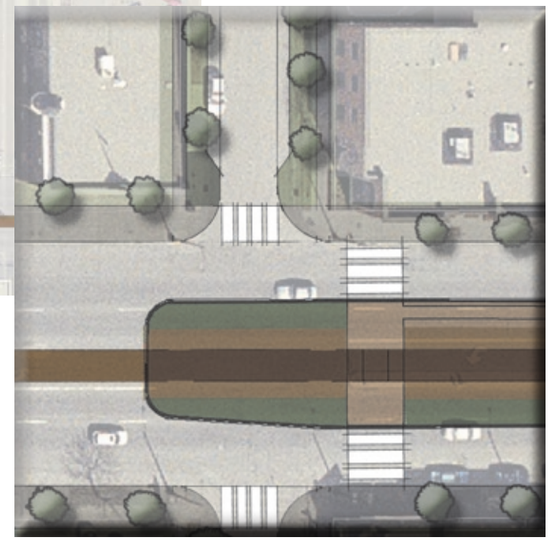






BIKE BOULEVARDS

Description:

Bike boulevards are a new design technique used to better accommodate bicyclists, walkers and vehicles in today's urban settings. This innovative approach incorporates typical design standards and traffic calming techniques. The overall intent is to design a bike route in a manner that heavily emphasis the presence of pedestrians/bicyclist. In other words, the walker/biker becomes the primary mode of transportation, leaving the motor vehicle as the secondary mode of transportation.

The City of Berkley, California has been the most successful in implementing a bicycle boulevard program. Their "Bicycle Boulevard Design Tools and Guidelines Report," serves as a model for successful traffic calming techniques that can be applied to slow traffic and create safer crossings at intersections. The City has been implementing these treatments in places where bicycles and cars can equally share the road. In most cases, they've been located on residential routes and in a few commercial areas. Overall this strategy has been very successful in creating seven bicycle boulevards, which now serve as the backbone to their bikeway network.

Typical Design Standards:

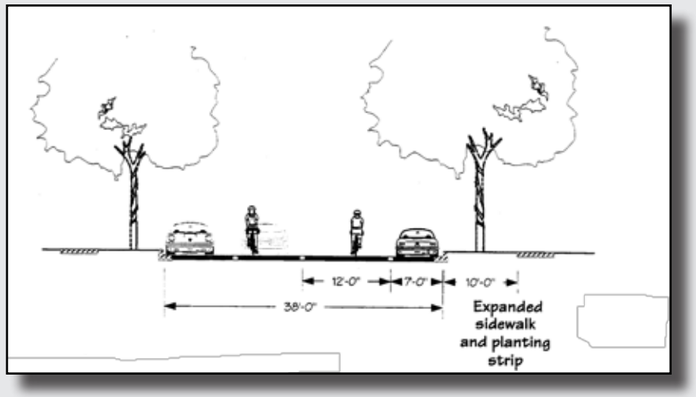
Typical bike boulevards have included visually dramatic pavement markings and signage. Traffic calming techniques have included bump-outs, median islands, diverters and roundabouts. Depending on the traffic calming technique, the amount of right-of-way and cost may vary in range. The design of a bicycle boulevard would take into consideration the following:

- Low volume streets
- Implementing traffic calming techniques
- Increasing the flow of bicycle movement
- Safe intersection crossings
- Visual markings to increase awareness
- Creating an environment that makes the bicyclist the primary mode of transportation

Precedents:

Typical cross section

(source:city of berkeley, ca - transportation div.)



Examples:

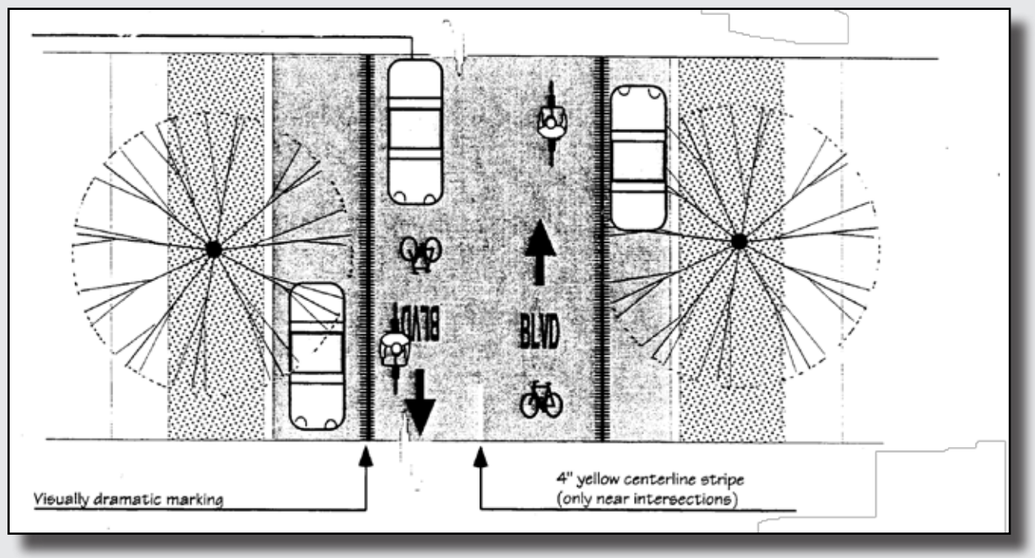
PORTLAND, OREGON

BERKLEY, CALIFORNIA

PALO ALTO, CALIFORNIA

VANCOUVER, BC, CANADA

plan view



Downtown

The purpose of the bikeway framework in downtown is to:

- » Create safe access to downtown;
- » Provide for east-west & north-south movement;
- » Create connections to existing regional bikeways that stop just short of downtown
- » Calm traffic on downtown bikeway routes;
- » Create routes that are safe for cyclists and increase awareness for motorists.

Access to Downtown

In spite of significant highway barriers and the Mississippi River at the edges of downtown, bikeways provide access to and from downtown from each direction. The principal routes are: Kellogg Bolevard from the west; Jackson Street from the north; Bruce Vento Trail and 9th Street from the east; and from the south Jackson Street-Sibley St., the new Lafayette Bridge, and the Wabasha Bridge.

From the west, Kellogg Boulevard is recommended as the primary access to downtown because it legibly links the existing regional bikeways on Summit Ave. and John Ireland Boulevard to downtown and the Sam Morgan Trail and avoids the steep topography of Ramsey Hill. Unfortunately, this section of Kellogg Boulevard also has high traffic volumes, multiple lanes, and freeway entrance and exit ramps which make for challenging cycling conditions.

Because Kellogg Blvd is an important gateway to downtown and makes regional recreation and commuter connections, it is essential that it be designed for all levels of cyclists, from novice to expert. To this end, the long-term vision for this bikeway is off-road trails on either side of the road and on-road bike lanes in each direction. In the near-term, conditions for cyclists can be improved by signing the existing ten foot wide sidewalk as a shared bike-walk trail, adding way-finding signage and implementing traffic-calming measures.

Local bikeways are recommended as supplements to Kellogg Boulevard. These routes will be preferable to some because they are on lower traffic streets, but they are indirect and way-finding will be challenging. To help with this issue, way-finding signage and pavements markings are essential. These alternative routes are:

- » Through the Minnesota History Center, linking 10th Street to Kellogg;
- » Irvine Hill Switchback – linking Summit Ave. to John Ireland Blvd;
- » Chestnut Street – linking the Irvine Ave. to the Sam Morgan Trail.
- » In keeping with their local classification, bike-boulevard or share-the-road treatments are recommended for these alternate routes.

Movement within downtown - commuter and local bikeways

Three commuter bikeways and one local route are recommended for movement through and around downtown: Fifth/Sixth Streets provide continuous east-west movement; Saint Peter/Wabasha offer north-south movements in the heart of downtown. Ninth and 10th Streets are a local bikeways facilitating east-west movement at the northern edge of town.

The long-term vision for downtown bikeways is for dedicated bike lanes on all commuter bikeways. Bike lanes provide a safe zone for cyclists and send a strong signal to both bikers and motorists that 'bikes belong' downtown and may be the most effective way to increase biking downtown (see sidebar).

Downtown road space is limited and must effectively accommodate many legitimate uses: pedestrians, traffic movement, bus lanes, parking, and loading. There simply isn't room for all of these uses on all streets. Today, downtown commuter bikeway streets could accommodate dedicated bike lanes on most recommended commuter bikeways using a combination of strategies:

- » Reduction of travel lane widths;
- » Removal of on-street parking;
- » Removal of travel lanes.

SHARED BIKE LANES

Description:

A shared bike lane or sharrow is a roadway that is signed to accommodate both bicyclists and motorists. The treatments are similar to those applied to a bike route or a dedicated bike lane. These types of routes are typically found in urbanized environments where roadways are curbed and guttered or have paved shoulders.

Sharing a bike lane with motorized vehicles may not be an ideal environment for the average bicyclists. They are typically used by experienced bikers that are comfortable riding with traffic. Implementing this treatment may take users awhile to get familiar with. However, bicyclists and motorists will need to keep in mind that the lane is to be shared by both users and to follow the rules of the road as if there were no shared lane.

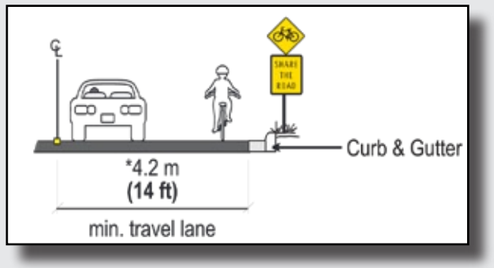
Typical Design Standards:

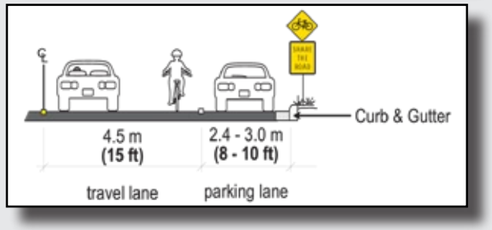
Shared lanes located in a local residential environment work best when there is a large roadway widths to allow room for passing cars. Lane width requirements may range between 12 – 14 feet. In these environments, signage is optional. Pavement markings or striping is included as part of the treatment.

In a more urbanize environments the lane width will depend on on-street parking. Right-of-way may range between 14 to 25 feet. Signage and pavement markings are typically required to indicate the lane is to be shared. If the lane is solely being shared with mass transit vehicles additional signage and pavement markings will be needed.

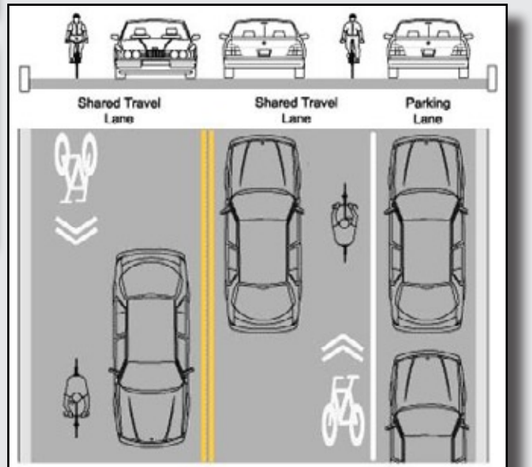
Precedents:

Typical cross section

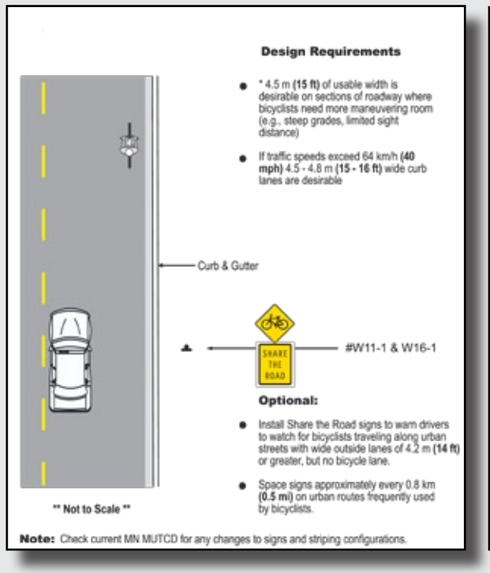


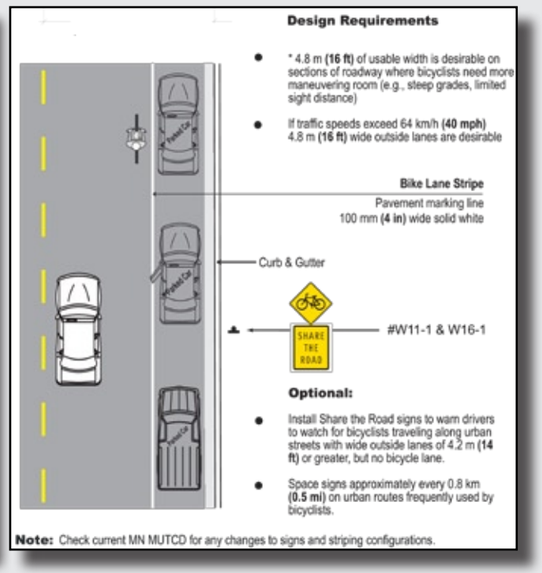


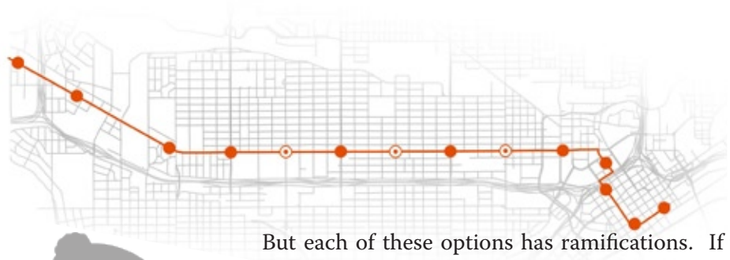
Examples:



plan view







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But each of these options has ramifications. If travel lanes are eliminated, traffic will move slower downtown. Eliminating on-street parking will make access and deliveries to some businesses less convenient. The reality is, dedicated bike lanes can only be effectively considered within the context of a downtown transportation vision that takes into account expectations for vehicular movement downtown and re-evaluation of one-way versus two-way streets, a unified parking strategy, and preferred transit routes as well the needs of bikers.

In the near term, all commuter bikeways, with the exception of Jackson-Sibley, will be share-the-road treatments. On Fifth and Sixth Streets, which have dedicated bus lanes, bikes will share a lane with the busses. On Wabasha-St. Peter bikes will share the right lane with traffic. On all these streets, sharow markings and bikeway signage will be essential for way-finding and bicyclist safety. Traffic calming and reduced speed limits are recommended on all downtown bikeway routes. Reducing the speed limit to 25 miles per hour, adding high quality streetscapes (landscaping, decorative paving, and pedestrian scale lighting) pedestrian bump outs, and enhanced crosswalks will slow traffic and make downtown safer and more pleasant for pedestrian and bicyclists.

On Jackson St.- Sibley St., striped, on-street bike lanes are recommended for two reasons: this route makes important regional connections between the Sam Morgan and Lake Phalen trails; and lanes already exist on parts of these streets. On Jackson, between 12th Street and 7th Street the number of traffic lanes can be reduced from six to four by eliminating one travel lane in each direction to accommodate bike lanes. From 7th Street to Kellogg the existing southbound bike lanes should be retained, and in the segment from Kellogg Blvd to the Sam Morgan trail, bike lanes should be added (see areas of special consideration). On Sibley, a bike lane can be accommodated by a combination of reducing travel lane widths and eliminating parking on one side of the street.

Figure 5.X: Typical Shared bus/ bike lane 5th & Wabasha Before and After

Areas of Special Consideration

Jackson from Kellogg to Shepard /Warner Road
Currently, this is a dangerous situation for cyclists with a bike lane that ends just before a steep hill and underpass where cyclists need to transition from the right lane to the left lane to make a left turn to access the Sam Morgan trail at Sibley. While this intersection will always be tricky, it can be improved to better meet the needs of cyclists as suggested in Figure X.

Broadway and 6th Street
Currently, cyclists must make a left turn from Broadway onto 6th at the location of a freeway ramp. A striped bike lane making the turn is recommended in addition to signage alerting cyclists to car traffic, and cars to cyclists. Yield to Cyclists signs are recommended on the freeway exit ramp to slow motorists and a warning sign for cyclists to watch for cars approaching from the right are recommended. Ultimately redevelopment of the Diamond Products site (which also will house the LRT Operations and Maintenance Facility) with the accompanying extension of the grid street pattern can improve bicycle and pedestrian access between downtown and the Vento Trail.

10th Street and Cedar
The 10th Street LRT station platform location will make continuous bike travel across Cedar impossible. Therefore, east-bound bike traffic will need to make a one-block detour to Exchange Street. Wayfinding will be essential to make this detour legible.

10th Street at the Minnesota History Center
Cyclists must make a left turn from 10th to either the History Center Shortcut or Main Street at the location of an I-94 off ramp. In this location, signage alerting cyclists to car traffic and requiring cars to yield to cyclists is recommended.

Insert plan diagrams - -- Jackson -Kellogg to River

Traffic Calming and Safety

A key element of bicycle and pedestrian friendly routes and bicyclist's safety is lower traffic speeds. Lower traffic speeds can be accomplished through use of proven traffic calming measures. Techniques such as "road diets" where lanes widths are reduced or lanes are eliminated create space for bike lanes and slow traffic. See Section 6 Walk Plan for more information about other effective traffic calming options. Minnesota rules allow the speed on streets with bike routes to be reduced to 25 miles per hour. That reduction in speed increases safety for both bicyclists and pedestrians.

A Road Diet

The purpose of a road diet is to "slim down" it's existing footprint. The overall intent is to improve safety, mobility and access for all modes of transportation while achieving economic and community goals. A typical road diet would achieve a series of the following initiatives:

- Reclaim street space for "higher and better use" than moving peak hour traffic.
- Reduce the number of lanes of traffic & conflict points.
- Reduce motorized vehicle speeds.
- Improve bicycle and pedestrian safety.
- Increase visibility and sight distance.
- Encourage an active streetscape and support the pedestrian realm.
- Improve the roadways aesthetics and visual qualities.

SAFE CROSSINGS

Description:

One of the biggest challenges bicyclists and pedestrians face are intersection crossings. A typical intersection has 32 conflict points when a vehicle approaches an intersection. If a pedestrian is in the intersection the conflict points double to 64. In order to ensure safe crossings there are treatments that can be applied to increase visibility between the pedestrian and motorist. Treatments may vary between additional lighting, pavement markings, cross-walk push buttons, signals, bicycle detector-activated signals and signal sequencing.

Roundabouts have also become increasingly popular in the State of Minnesota. This traffic calming technique reduces the number of conflict points and slows traffic while maintaining mobility. Local roadway agencies have begun to incorporate the roundabout as preferred alternative in many cases. The City of Richfield, Medford, Carver County are a examples of communities who have implemented this treatment.

Typical Design Standards:

Any number of devices will help reduce the risk of accidents and increase the awareness between pedestrians and motorists. Traffic control devices and intersection designs should be determined on case by case bases. Further engineering work will need to be done to determine the appropriate treatments for intersection crossings.

Roundabouts should be included as an alternative concept when evaluating intersections designs. Right-of-way will depend on the footprint of the roundabout, but typically requires additional space to implement.

Precedents:

Typical Treatments

Motor Vehicle Speed	ADT	Bikeway Intersection Treatment
>80 km/h **(>50 mph)**	Any	Grade Separated (Good)
		Traffic Signal and 60 km/h **(40 mph)** Speed Zone (Satisfactory)
70 km/h **(45 mph)**	Any	Grade Separated (Good)
		Traffic Signals (Satisfactory)
60 km/h **(40 mph)**	>7,000	Grade Separated (Good)
		Traffic Signals (Satisfactory)
	<7,000	Traffic Signals (Good)
		Crosswalk + Median Refuge Island (Satisfactory)
50 km/h **(30 mph)**	>9,000	Grade Separated (Good)
		Traffic Signals (Satisfactory)
	5,000 to 9,000	Traffic Signals (Good)
		Crosswalk + Median Refuge Island (Satisfactory)
	<5,000	Crosswalk + Median Refuge Island (Good)
		Crosswalk (Satisfactory)

Typical Cross Section for Roundabouts

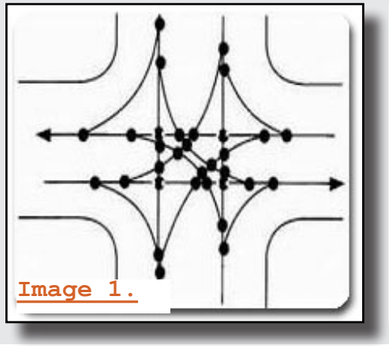


Image 1.

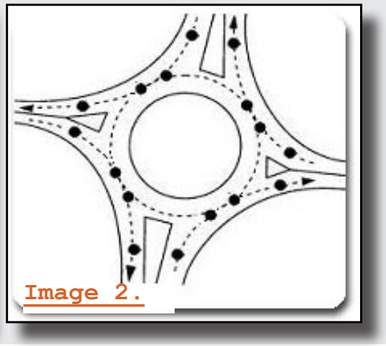


Image 2.

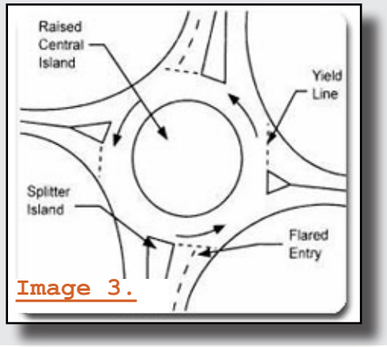


Image 3.

Image 1 indicates the 32 conflict points a traditional intersection has. Image 2 indicates the 16 conflict points a traditional intersection has. Image 3 depicts the layout of a modern roundabout.

Examples:

City of Richfield

Highway 7 and Highway 225 and Carver County 10

Wayfinding

Wayfinding (the ways in which people orient themselves in physical space and navigate from place to place) is a vital component of an effective bicycle and walkway system. People need to be able to easily understand and navigate bikeways and walkways in order to conveniently and safely get to their destination. Wayfinding can help enhance economic development and sense of community by making people aware of key community resources and destinations. Wayfinding also raises the awareness of bicyclists and pedestrian in the minds of motorists. Wayfinding typically consists primarily of signs, maps and other navigational aides to help people use bike and walk routes and find destinations.

Wayfinding signs for bicyclists typically show destination, direction and distance. Signs are typically placed where routes change or there is a change of direction and periodically along the route for route identification. Many places use bikeway system maps at key locations to aide movement and raise awareness of the bikeway options. In addition to signs, some communities' use pavement marking as a wayfinding tool as these can be easier for cyclists to see. Most bikeway wayfinding signage follows the Manual on Uniform Traffic Control Devices standards (MUTCD). MUTCD standards are evolving rapidly as new signage innovation occurs and new research is conducted. Seattle and Chicago are two examples of recent bikeway wayfinding systems which helped shape the evolving MUTCD standards. Some communities modify MUTCD standards to add logos or city/neighborhood images to wayfinding signs.

Wayfinding signs and methods must balance the need to provide clear, understandable, helpful information without causing visual clutter. Most wayfinding methods combine the use of a "universal" bicycle symbol with route and destination information. Directional signage must also be readable from a moving bicycle and from a car to raise motorist awareness of bike routes.

Recommendations

The Central Corridor Bikeway Framework Plan uses three categories of bikeway routes differentiated by their function and intent – Regional, Commuter and Local. Trip-end facilities are also key components of the bikeway system. Therefore the wayfinding recommendations are based on these four categories of facilities plus recommendations about delivery of route information using print and digital media.

The bikeway wayfinding recommendations use a layered approach to guide bikers to their destination. The layers and signage become more prominent as the biker approaches the LRT lines and downtown and signage and symbols are to be concentrated at key decision points. Wayfinding would include signs and pavement markings. All bikeway signs should have clear readable lettering and should utilize the universal bicycle symbol. Adding the Saint Paul logo would help build community identity. Three sign types are recommended. Type One is a square route sign containing the route direction/major destination, bike symbol and city logo. These would be placed every 1/2 mile along the bikeway route, after every turn and after every major signalized intersection. Type Two is a rectangular "blade" style directional sign containing the destination name, distance, directional arrow and bike symbol. Type Two signs would be placed at intersecting routes/decision points. Type Three signs are "bike buttons" containing just the bike symbol. These bike buttons could be added to existing streets signs as an additional subtle method of bike route identification, especially along local bike boulevard routes. Sign types one and two are based on the successful Chicago Bikeways Signage System.

Regional Bikeways

The use of regional bikeways, the "spine" of the system, is likely to involve longer-distance bike trips. Therefore major end point destinations should be listed on the Type One signs. For example along Summit Avenue the Type One signage could read "East to downtown" and "West to River Road". Intersections of regional and commuter bikeways should have Type Two blade signs alerting riders to routes such as "Grotto Ave. Bikeway."

Commuter Bikeways

These bikeways form the "bones" of the system and would be used by both longer-distance riders and local riders. Type One Signs would say "Aldine Bikeway" or "Prior Bikeway" - etc. Directional Type Two blade signs would direct bicyclists to regional bikeways "Pierce Butler – ¾ mile" and to destinations "Jimmy Lee Recreation Center - 1¼ mile". Directional signage could be located in planter islands/traffic diverters proposed as traffic-calming measures in the intersections between commuter and local bikeway routes.

Local Bikeways

Local bikeways carry riders for short distances to key destinations and do not provide for through trips. Wayfinding signs on local bikeways should highlight destinations such as Snelling Transit Station and in this case can include a bike parking symbol. Route signage on local bike boulevards can be more place-based such as "Charles Avenue Bike Boulevard." The local bikeway wayfinding signage should be supplemented by pavement marking directional arrows at key intersections.

Further evaluation, design protocol, and selection of sign locations and destination names should occur as part of a Bikeway Wayfinding Plan. Wayfinding signs should be installed in a test section of the Corridor (Prior to Griggs, between Summit and Pierce Butler) and their performance evaluated before installation in the rest of the Corridor.

Trip End Wayfinding

The final part of a bicyclist's trip is typically finding a place to park their bike. Wayfinding signage on local bikeways should include direction to secure bike parking, bike racks or bike stations (where available). Clear signage at these destinations allow for direct, safe routing of cyclists.

Wayfinding Media Options

In addition to the wayfinding signs and pavement markings, a city-wide bikeway route map (including Central Corridor bikeways) should be made very accessible to residents, workers and visitors. The system map should also be displayed in prominent public places and be made available at civic locations and events and distributed through private partners, such as bike shops, hotels, etc. Lack of awareness of safe bicycle routes is one of the biggest obstacles for new riders. In addition to a paper map, a downloadable digital bike route map should be available on-line. Use of a regional on-line on-demand bike route planning tool, similar to Map Quest, is recommended. That tool would allow people to enter a starting point and a destination and receive information about the best bike route for their desired bike trip. The University of Minnesota's Cyclopath.org is an operating example of a bike routing on-line tool.

Type One - Wayfinding

Type Two - Way Finding

Type Three - Way Finding

Trip End Facilities

5

Trip end facilities refer to the amenities and support facilities located at the bicyclist's or pedestrian's destination within the Corridor. Examples include bike parking/ bike storage, benches, lighting, shelters, showers and lockers. Trip end facilities also include area and route maps and kiosks, which are discussed in the Wayfinding sections of this Plan.

The strategy for provision of bicycle trip end facilities is based on likely demand and the use of facilities. For example, some facilities, like bike parking, are needed all along the length of the Corridor with higher concentrations of secure bike storage needed near LRT stations and in downtown. Other facilities like bike stations are only appropriate at high volume bike use areas. Secure bike storage is a key ingredient of a supportive bike environment and it is a goal of this Plan to provide secure bike storage as needed to meet demand.

Bike Parking/Storage Demand

There will be a need to implement a variety of trip end facilities throughout the Central Corridor. In most cases, the design of each transit station platform will include the appropriate type of pedestrian treatments such as shelters, benches and lighting. However, bike parking needs are a bit more complex when it comes to evaluating trip end facilities. For the purpose of this Plan we know that bike parking will be a necessity throughout the corridor. The intent of this section is to help answer three important questions in regards to bike parking facilities:

- Where will there be demand for bike parking?
- How much bike parking is needed?
- What should bike parking/bike storage look like?

Bike parking demand

Bike parking will be needed at each transit station and throughout the Central Corridor. The primary need will be focused at the transit stations and will vary in treatments. Bike parking demand is largely influenced by the security and convenience of parking. Secured covered or indoor parking has a much higher demand over outdoor unsecured racks. It is assumed the majority of transit users accessing the stations by bike will be seeking long-term secured parking needs.

The LRT stations at Raymond Avenue, Snelling Avenue, Rice Street, 4th & Cedar and Union Depot have been identified as the primary target areas for incorporating secured, long-term bike parking facilities. These stations were selected based on high ridership forecasts, existing and future regional bikeway connections, and high concentrations of nearby employment. Target station areas are intended to serve as bike stations and/or support large volumes of long-term secure bike parking. Bike parking will also be warranted at the other stations, but at lesser amounts. Non-target areas will be focused on short-term parking needs and may include limited long-term storage such as bike lockers.

Overall bike parking demands will change over time. Ridership will evolve and travel patterns will change as well. The following forecast situations were established to determine how much parking is needed and when.

Initial Bike Parking Needs

This forecast assumes a baseline of 2% of users will be accessing the LRT station by bike. The 2% was derived by the mode share split for bicyclists in St. Paul as indicated by the Met Council's Travel Behavior Inventory (TBI).

The baseline demand was adjusted to reflect 50% of bike riders taking their bicycle onboard the train and 50% parking their bikes near the station.
This scenario best reflects immediate forecast needs on opening day of the LRT.

Mid-Term Bike Parking Needs

This forecast assumes a modest increase in bike riders accessing the LRT stations due to improvements made to the bikeway system. A higher level of ridership would result in reduced room to take a bike on board, resulting higher demand for bike parking.
This scenario best reflects mid-term needs based on future bikeway improvements to the corridor.

Bike Parking

Number of bikes that can be parked in one car parking space in a paved lot: 6 – 20.

Estimated cost of constructing one parking space in a paved lot: $2,200.

Estimated cost of constructing one parking space in a garage: $12,500.

Trip End Facility Definitions

Bike Parking - Secure convenient parking is a must. Bike riders want to be able to park their bicycle as close as possible to their destination be it a shop, a restaurant or a residences. They will lock their bike to a tree, parking meter or sign if it is the best location and there are not acceptable alternatives nearby. Bike parking in the form of bike racks, bike lockers, or secure bike storage areas should occur along the riders natural route and as close to the destination as possible. Parking should be well lit and in an active "eyes on the street" place. Conventional outdoor bike parking in bike racks is primarily for short-term parking (up to four hours) and secure bike parking is more of a day long or overnight situation.

Secure Bike Storage - Secure bike storage offers bike commuters a safe, secure and long-term alternative for storing their bicycle. The integration of secured storage should be focused at designated areas to establish bike stations. The most common type of facility used is bike lockers. Storage units of this nature are usually in high demand and are the preferred choice for long-term bike parking. Other forms of secured bike parking have included bike cages, outdoor/indoor facilities with observation and smart card access to storage units and indoor staffed bike storage facilities. Secured bike parking should be located in close proximity to transit stations and work destinations for easy access. Bike storage capacity should be flexible to provide enough space for future expansion. (see image)

Bike Stations – Bike stations incorporate a wide range of uses and support facilities. The overall intent is to create a hub that accommodates bicyclists and encourages social gatherings. These complimentary uses may include coffee shops, cafés, bike rentals or bike repair shops. Secure bike storage would be emphasized as the preferred type of bike parking element. Bike stations may also include showers and personal lockers. A bike station would typically be located at an LRT station that supports mixed use/transit oriented developments and severs as an intermodal transfer between bus, light rail and heavy rail.

Benches - Seating offers pedestrians and bicyclist a place to rest, socialize or an area to wait for transit services. Seating is an amenity that can be applied in various locations to create a pedestrian friendly atmosphere. The location of benches should be strategically placed outside of the pedestrian walkway and visible to the user. (see image)

Lighting - Lighting provides more than just an aesthetic value. It provides a stronger sense of security and creates a safer environment at night time. Lighting is also utilized at transit stations to increase visibility between the platform and rail. Well light walkways are crucial for a safe walking environment. (see image)

Shelters - In order to encourage year round transit use there needs to be desirable waiting areas for patrons. Shelters offer a place of refuge for transit users during undesirable weather conditions. Shelters should be focused at transit stops. The size of each shelter depends on the level of service and ridership. (see image)

Showers and Lockers - Showers and lockers are a wonderful amenity to offer at key regional bike-transit hubs and at major employment destinations. These facilities allow a biker to cleanup and store their items before reaching their final destination. Integrating these facilities at bike stations should to be focused at large regional stations and employment sites that experience high levels of ridership to be cost effective. (see image)

5

Long-Term Bike Parking Needs

This forecast assumes a higher percentage of users will be accessing the LRT stations by bike with the addition of significant bikeway improvements. This also assumes there are high levels of LRT ridership with no space on the train cars to transport a bike during peak hours. The end result is a high volume demand for bike parking.

This scenario best reflects long-term bike parking needs when ridership is at a high level and significant bikeway improvements have been made to the corridor.

How much parking is needed?

Forecast bike parking needs, by the scenarios listed above, are shown in Table X. The table shows forecast bike parking needs on day one LRT operations, after bike improvements are made and after LRT and bike use has matured. It is important to keep in mind that these bike trip percentages are based to some extent on the presence of long-term parking at the designated bike stations- Raymond Avenue, Snelling Avenue, Rice Street, 4th & Cedar and Union Depot and that the presence of secure, convenient, long-term bike parking will attract bike parking and bike use to those locations.

The table shows the need for a flexible approach to bike parking, as bike use and bike parking will grow over time. It is important to plan for the space needs at/near each station and have the flexibility to add bike rack, bike lockers or secure bike storage. The actual demand for bike parking may be different based on influencing factors, such as redevelopment or increased energy costs. Therefore, Table X was formulated to be a working forecasting tool. To ensure accurate demands are being met, inventorying and monitoring bike parking usage will need to occur on a regular basis. This will ensure bike parking facilities are being utilized to their fullest potential and provide support for future needs.

What should bike parking look like?

Bike parking should be integrated as part of any redevelopment initiative near the LRT stations. If demand warrants, bike stations should take precedent when ever possible. Bike stations may be incorporated as a separate facility or part of a mixed use/transit oriented development. It is unlikely that every station will be able to develop in this manner. Integrating bike parking at the stations should at a minimum include some form of secured parking. The following types of secured parking should be considered in the following order:

1. Bike stations as part of mixed use developments or as a separate facility.
2. Indoor secured storage with observation.
3. Covered secured storage with observation, such as a parking ramp near the parking attendant.
4. Bike lockers on demand.

In most cases, bike lockers will be the most feasible to accommodate in the near term and at less frequently used stations. Utilizing existing infrastructure, such as vehicle parking ramps offer inexpensive ways to facilitate parking needs and requires minimal cost to operate.

As demand warrants additional storage at the target bike stations, could be provided in vertical or in-door parking facilities (see image). These types of treatments are common in countries such as Holland and Japan and in Portland, Chicago, Seattle and California that experience high volumes of bicycle use and locally along the Midtown Greenway in Minneapolis.

Short-term parking elements (bike racks) will be required throughout the entire corridor to serve retail, service and restaurant uses. Residential bike parking should be encouraged to occur within secured areas accessible only to tenants.

Preferred bike racks can vary in type (see examples of recommended bike parking racks), [side bar] but should occur in the streetscape amenity zone (outside of the pedestrian clear zone), in off street areas such a boulevards, on private property, or in converted on-street parking spaces. The placement of bike racks should be spaced according to land use demand and integrated into the streetscape.

Trip End Facility Recommendations

The most apparent need throughout the Central Corridor has been on bike parking, but benches, lighting, shelters and personal facilities are also needed to enhance bike use. In most cases, many of these amenities have already been incorporated into the transit station platform design. However, the integration of trip end facilities will also need to occur throughout the corridor and will vary in type. This variation will be dependent on the facilities intent to capture specific users. For instance, long-term parking will be integrated at the stations to capture bike commuters and short-term parking will be integrated along the corridor for local trips. The following trip end facility recommendations have been broken out by their geographical context.

Corridor Focus

The placement of bike parking elements will be required throughout the entire corridor. These facility types are intended to accommodate the local biker who is seeking short-term parking needs and to accommodate transit stations that have not been identified as target areas for long-term parking. Benches and lighting will be integrated as part of the pedestrian improvements discussed in further detail in the Walkway Plan.

Specific Local Facility Recommendations

- The ideal location for bike rack elements should be in front of key destinations, such as restaurants, coffee shops, public spaces and retail.
- Locate bike parking along the length of University Avenue as part of the streetscapes. Many sidewalks on University Avenue will be 10 feet wide so use simple bike loops and dual purpose parking meters/bike racks (see image) that allow 1-2 bikes to be parked parallel to the sidewalk (see plan view). This will not interfere with pedestrian movement, yet will supply the desired parking near shops, businesses and restaurants.
- Benches should be focused at transit stations or bus stops. The placement of benches should be located in highly visible areas that will be utilized to their fullest potential

Station Area Focus

The LRT stations will need to integrate bike parking elements; however, the primary focus for the target areas (Raymond Avenue, Snelling Avenue, Rice Street, 4th & Cedar and Union Depot) will require secured, long-term parking. It is unlikely the LRT station's platforms will be able to accommodate storage units. Therefore, the placement of these facilities will need to occur within close proximity to the stations. Additional trip end facilities like benches, seating and lighting have already been integrated as part of the overall station platform designs.

Table 5.1: Bike Parking Demand Needs

Stations	Peak Hours	Off-Peak Hours	Total Daily	Initial Bike Parking Needs	Total Short-Term Needs	Adjusted Initial Bike Parking Needs	Total Adjusted Bike Parking Needs	Mid-Term Bike Parking Needs	Total Mid-Term Bike Parking Needs	Long-Term Bike Parking Needs	Total Long Term Bike Parking Needs
Westgate Station	750	390	1,140	2%	23	0.5%	6	1.0%	11	2.0%	23
Raymond Avenue Station	840	410	1,250	2%	25	1.5%	19	3.0%	38	5.0%	63
Fairview Avenue Station	1,300	600	1,900	2%	38	0.5%	10	1.0%	19	3.0%	57
Snelling Avenue Station	1,500	1,430	2,930	2%	59	1.5%	44	2.0%	59	5.0%	147
Lexington Parkway Station	540	390	930	2%	19	1.0%	9	2.0%	19	3.0%	28
Dale Street Station	420	290	710	2%	14	1.0%	7	2.0%	14	3.0%	21
Rice Street Station	780	420	1,200	2%	24	1.5%	18	3.0%	36	4.0%	48
Capitol East Station	250	140	390	2%	8	1.0%	4	2.0%	8	2.0%	8
10th Street Station	1,080	780	1,860	2%	37	0.5%	9	1.0%	19	2.0%	37
4th and Cedar Streets Station	820	380	1,200	2%	24	1.5%	18	3.0%	36	4.0%	48
Union Depot Station	1,210	910	2,120	2%	42	1.5%	32	3.0%	64	5.0%	106
Total:	**9,490**	**6,140**	**15,630**	**-**	**313**	**-**	**175**	**-**	**321**	**-**	**585**

Source: The peak hour and off-peak hour totals were based on the Administrative Draft EIS, dated January 2009 - Table 6.1 2030 Central Corridor LRT Daily Volumes by Station

Specific Station Area Facility Recommendations

» It is recommended that secure bike storage be provided at the Raymond Avenue, Snelling Avenue, Dale Street, Rice Street, 4th & Cedar and Union Depot stations. The preferred location is either indoors as part of a multi-use bike station. Another option is a freestanding bike station that is staffed or is secured through Smart Card access. If secure bike parking cannot be provided indoors or in a station, space within parking structure near the ramp attendant is often a suitable alternative. Bike lockers are an interim solution at high demand locations and may be a longer term solution at lesser used stations. Care must be taken to locate bike parking/storage along the cyclist's natural route of travel, but also located it such that there is not a conflict in limited pedestrian space. For instance, bike parking could occur within the Spruce Place parking ramp or the Snelling Avenue station could have bike lockers located in proximity to the north platform at Asbury St. and University Avenue. The southbound platform could also include bike lockers near the intersection of Fry Street and University Avenue. (see image)

» Concentrations of bike racks should occur at the local bikeway connections to each end of the LRT station platforms. The bike racks should be located within the local street right-of-way or on public land outside of the University Avenue right of way (see plan view).

» Lighting should be utilized at the stations for night time purposes and safety measures.

» Locate a regional bike hub at Union Depot. Because of its' end of the LRT line location, the potential for transfers between light and heavy rail and location in downtown, Union Depot will need secure bike storage and is a great location for integrating additional amenities, such as showers and lockers, to support bike use. A bike station that includes bike service, bike rental, plus a coffee shop, bar/restaurant, or other supportive use can create a hub of activity that furthers bike use.

» As opportunities arise, add bike stations at the Raymond and Snelling Stations.


5

Walk Plan

Pedestrian movement is a key attribute to a successful City and a vibrant corridor. It wasn't that long ago that our primary mode of travel was by foot. Over time, automobile use grew in popularity and influenced our communities in ways that we couldn't have imagined. Today's roadway network is also the primary network for pedestrians. This works well on low traffic local streets, but high volume roads, at best, create unpleasant pedestrian conditions and at worst, pose significant barriers to pedestrian travel. Finding an appropriate balance between the travel modes is a goal of this Plan. It is important to recognize that regardless of our preferred mode choice, we all use the pedestrian realm. Whether our trip originated by car, transit, or bike; we all walk to complete our trip. Studies show that people walk more when they have a pleasant convenient walking environment.

As outlined in Chapter 4 pedestrian conditions in Central Corridor are generally pedestrian tolerant, in most places you can walk on off-street sidewalks to get to your destination, but the experience is not made pleasant by streetscape. There are, of course, exceptions. Some areas, such as Rice Park downtown, are exceptional pedestrian places and other areas that are decidedly pedestrian intolerant with sidewalk gaps, poor lighting and difficult intersection crossings.

Enhancements to the pedestrian realm are needed to make walking safer and more pleasant in the Central Corridor and downtown. Moving from pedestrian tolerant to pedestrian friendly will pay dividends in terms of increased LRT ridership, improved property values, greater revitalization and development and increased neighborhood quality of life.

Pedestrian Framework

6

Creating Pedestrian Friendly Streets

In the Central Corridor and downtown, this plan recommends moving the pedestrian realm from pedestrian tolerant to pedestrian friendly by making streetscape improvements on key streets (See pedestrian framework, Figure X, specific streets are discussed below). There are four key zones in a pedestrian friendly streetscape. Each zone, as depicted in Figure X represents different elements that need to be considered as part of pedestrian friendly walkway:

1. Street Edge – A clear space next to the curb to separate pedestrian and vehicular traffic and to allow room for vehicle door openings.

2. Amenity Zone – The amenity zone serves three functions. The first purpose is to buffer pedestrians from the street. The second function is to provide higher aesthetic values by including landscaping to "green" the street. This area also accommodates utilities, hydrants; trash/recycling receptacles, signage, light fixtures, benches and bike parking.

3. Clear Zone – The pedestrian clear zone is the area used for pedestrian movement. It should be free of all obstacles. A walkway clear zone should be wide enough to allow pedestrians to pass one another with ease.

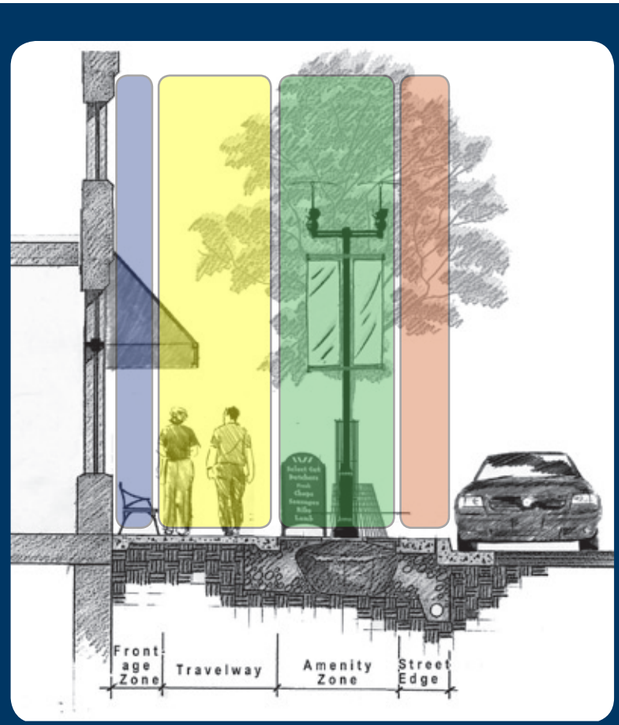
4. Building Frontage Zone – This area next to the building is for ingress and egress between the walkway and the building. The frontage zone also allows for window shopping and provides room for pedestrians to socialize. In key locations the building frontage zone should be sized and designed to create pedestrian gathering places. This can occur as outdoor seating adjacent to restaurants, coffee shops, cafes or bars and as plazas and pocket park spaces.

Incorporating all four zones on commercial streets in the central corridor will create more than just a walkway. It will contribute to a safe, active walkway that people seek out. These routes will become vibrant destinations, building a stronger sense of place and an enjoyable experience.

The recommended width of these zones and the overall width of the walkway varies with the type of street and is influenced by space availability.

Did you know?

- **25% of all trips are one mile or less of our home.**
- **40% of all trips are within two miles of our home**
- **82% of those short trips are made by car.**



Commercial Streetscape Widths

	Constrained -Recommended
Street Edge	1.5 ft. - 2.5 ft.
Amenity Zone	6 ft.- 8 ft.
Travelway	6 ft. -10 ft.
Building Frontage Zone	2.5 ft. - 3 ft.

Pedestrian Safety

Pedestrian movement also relies on safe street crossings and benefits by lower vehicle traffic speeds. Public input indicated concerns about the safety and comfort of walking across University Avenue and on the vehicle bridges over I-94. If pedestrians do not feel safe crossing a street they will begin to avoid these areas and find alternative walkways or choose to drive or forgo the trip all together. Pedestrian crosswalks at traffic signals should be well marked with signage, signals, and pavement markings and the walk phase of the signal should allow adequate time for pedestrians to cross the street. The effective crosswalk distance can be reduced and traffic calmed by adding pedestrian bump outs (Figure X) which are curb/side walk extensions at an intersection. Eliminating free right turn lanes and tightening up the curb radius also slows turning vehicles which enhances pedestrian safety and comfort. Public comments also expressed concerns about drivers running red lights, not stopping before turning right on red, turning right on red where that movement is prohibited and excessive speed. There is a perception of the need for greater enforcement of traffic laws.

New traffic signals and cross walks to be added along University Avenue as part of LRT construction will help enhance pedestrian crossing and safety. The signal timing at all signals along University Avenue should be adjusted to allow adequate walk signal phase time.

There is a wide variety of methods to reduce traffic speeds. These include speed limit enforcement, street design and traffic calming methods. A comprehensive approach combining these methods is warranted along University Avenue.

Table 6.1 Pedestrian Survival Rates - Vehicle Speeeds

Vehicle Speed (MPH)	Pedestrian Survival Rate
20	95%
30	55%
40	15%

Sidewalk bump-outs, signage, and pavement markings enhance crosswalk safety

Traffic Calming Techniques

- **Enforcement of traffic laws.**
- **Narrower lane widths.**
- **Visually narrow street corridors framed by buildings, landscaping, etc.**
- **Fewer lanes - "road diets".**
- **Lower posted traffic speeds.**
- **Signals, crosswalk signage and markings.**

Pedestrian Crossing Improvements

- **Adequate walk signal times to cross the street.**
- **Use of count down walk signals.**
- **Pedestrian refuge islands.**
- **Enhanced crosswalks – 'piano" style pavement marking, colored pavement/pavers, raised crosswalks or raised intersection tables, advance warning signage and advance stop bars (10-20 feet**
- **from crosswalks).**
- **Pedestrian bump outs/curb extensions and neck downs at intersections.**
- **Install two pedestrian ramps at each corner parallel to crosswalks, instead of having one ramp at the corner.**

Walk Improvements

6

Moving from Pedestrian Tolerant to Pedestrian Friendly

Enhancements to the pedestrian realm are needed to make walking safer and more pleasant in the Central Corridor. Changing the pedestrian environment in the Corridor from pedestrian tolerant to pedestrian friendly will pay dividends in terms of increased LRT ridership, improved property values, greater revitalization and development and increased neighborhood quality of life.

Pedestrian improvement recommendations are categorized by their geographical context. Improvements to the existing pedestrian network will be a result of redevelopment initiatives, public/private revitalization projects and public enhancements. These recommendations are intended to build upon the existing walkway network and make it pedestrian friendly.

Downtown

Recommendations for pedestrian improvements downtown include:

- Extending the high quality streetscape on 4th, 5th, and 6th Streets east from Wabasha St. to Cedar Ave. visually connecting LRT to the Rice Park area.
- Create a high quality streetscape identity for LRT streets so that these streets become exceptional pedestrian places.
- Streetscape improvements along 5th Street and 6th Street, which are the important transit corridors. These streets, particularly from Cedar Jackson would benefit from enhanced amenities such as: street trees or planters; pedestrian scale lighting; capturing additional sidewalk space on the bus stop side of the street where possible, either in conjunction with redevelopment or by reducing the street width; and encouraging pedestrian supportive land uses such as restaurants, news stands, and retail at street level.
- Creation of a loop of "park streets" with high quality streetscape similar to that on Wabasha and St. Peter linking existing and planned parks, downtown residential areas, and the Mississippi River.

The Central Corridor

Recommendations for pedestrian improvements in the Central Corridor include:

- Infill sidewalk gaps at the west end of the corridor around the Westgate and Raymond Stations (see Pedestrian Framework, figure X).
- Pedestrian improvements to the Midway Shopping district should be put in place as redevelopment occurs. New streets should have ample sidewalks and have a well defined street edge, amenity zone, clear walking zone and building frontage area. Redevelopment form should encourage reestablishing a grid street pattern with walkable blocks and safe and legible pedestrian walkways from University Avenue to building entrances.
- Streetscape improvements, with a focus on lighting and personal safety, are needed for many streets between I-94 and University Avenue. Pedestrian/cyclist bridges should be improved with safe approaches, lighting, ornamental lighting and increased width to better accommodate pedestrians and bikes. Vehicle bridges/underpasses should be improved with better lighting and ornamental railings. When rebuilt, bridges/underpasses should be widened to better accommodate vehicles, bikes and pedestrians.

University Avenue Corridor

Though the sidewalk area has already been established as 10' along most of the corridor, additional space in the building frontage zone should be captured whenever possible to create small plazas and pocket parks for outdoor restaurant seating, public gathering places and retail display areas, all of which enliven the street and can elevated it from pedestrian friendly to an exception pedestrian place.

Pedestrian wayfinding has similar needs as bikeway wayfinding; to provide information about destination, direction and distance. Since pe-

On University Avenue, carving out space in the building frontage -zone for cafe seating will support the street activity needed for a well loved pedestrian place

Existing pedestrian bridges over I-94 should be widened to better accommodate both pedestrians and bikes and made more pleasant with ornamental railings and better lighting, similar to this bridge over I-35E.

destrians move at a slower pace and over shorter distances than bicyclists, wayfinding signage is typically focused on destinations within ½ to 1 mile. Since pedestrians can easily stop to read information, maps and kiosks can be used in addition to signs to display more detailed information about routes, destination and area destinations. Area maps and kiosks and walking routes often combine navigation information with education about natural and man-made features. There is no national standard for pedestrian wayfinding comparable to Manual on Uniform Traffic Control Devices (MUTCD).

There are a variety of pedestrian wayfinding treatments that would be appropriate to place throughout the entire corridor. The LRT stations are a prime opportunity to meet many pedestrian wayfinding needs by installing route maps and area destination maps. The following pedestrian wayfinding recommendations focus on general guidelines for the Central Corridor and more specific recommendations for downtown.

Pedestrian Wayfinding

Downtown

In addition to the downtown LRT stations wayfinding destination markers should be in placed at the following intersections:

- Sibley Street and 4th Street
- Sibley Street and 5th Street
- Jackson Street and 4th Street
- Jackson Street and 5th Street
- Wabasha and 4th Street
- Wabasha and 5th Street
- Saint Peter and 4th Street
- Saint Peter and 5th Street

Integration with skyways

Better integrating the street level pedestrian network with the skyway network will facilitate movement between the systems and contribute to activity on the street. This can be done by creating frequent and legible connections between the two systems. Strategies include: improved signage at street level building entrances where skyway connections can be made and increasing the number of access direct points at street level (places where the pedestrian does not have to navigate to the core of a building to access the skyway system).

Key pedestrian places and tourism sites

Add area way-finding signs/maps/kiosks at Rice Park, Mears Park, and the Farmers Market, Xcel Center, Science Museum, and Children's Museum.

Station Areas

Routing to transit stations - Utilize green street connections to either end of the station platforms. These connections will have a distinct pedestrian character with landscaping, a pedestrian bump outs and intersections and way-finding signage. The frequency of the green streets provides access along the length of University Avenue to non-transit destinations as well.

Each LRT station platform should have a detailed orientation map to the station area (area within ¼ mile of the station). These maps can provide guidance to transit user and walkers about area, streets, destination and amenities. (see examples)

Corridor Wide

The initial priority for wayfinding should be focused at the LRT stations and within downtown. Outside of downtown, additional pedestrian wayfinding treatments, beyond the kiosks/maps recommended for LRT platforms, may be warranted as areas redevelopment and pedestrian destinations are developed. .

Wayfinding

Orientation kiosks and maps are recommended at key tourism sites orient visitors and highlight other attractions within walking distance.

Walk Framework

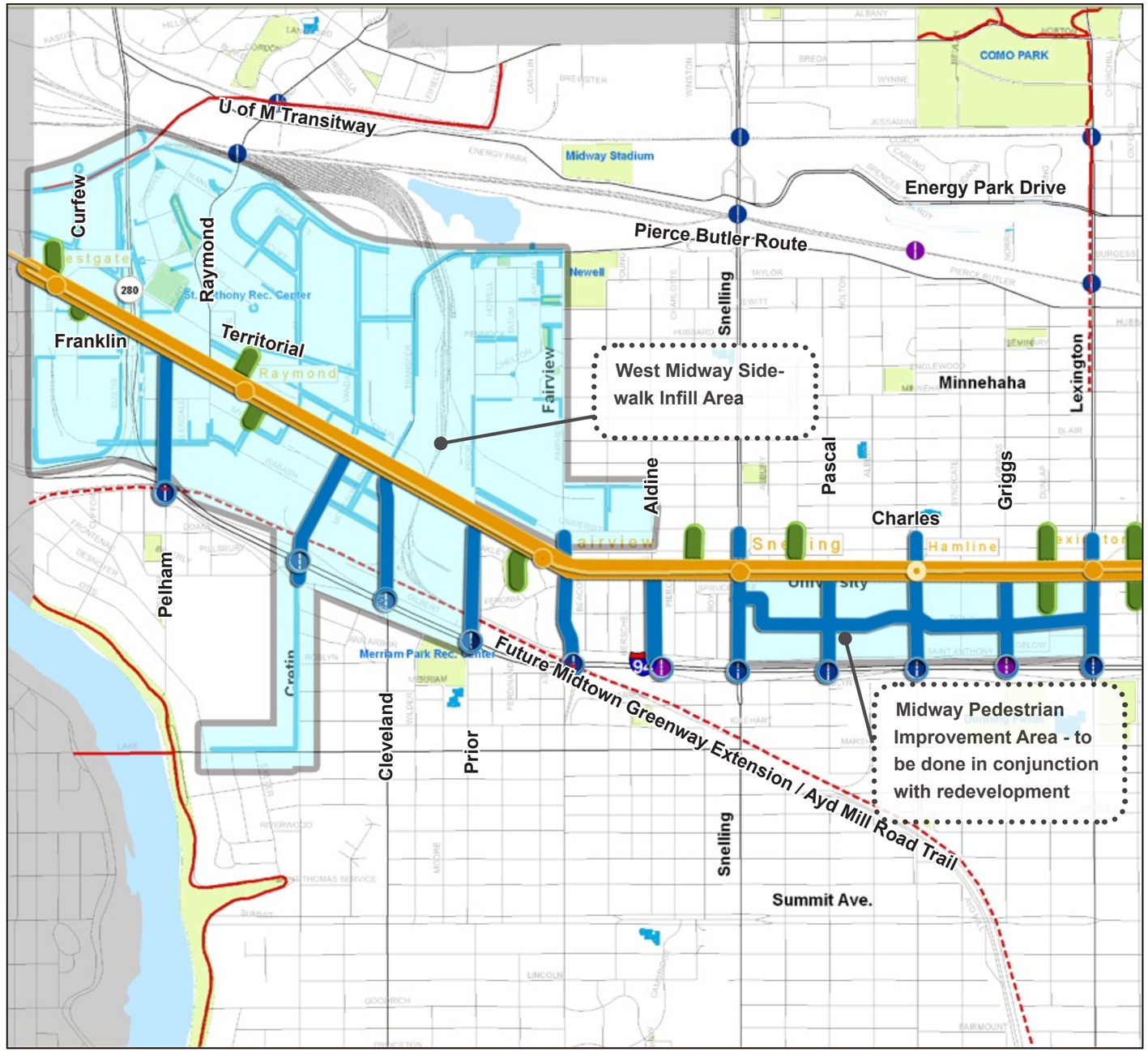
6

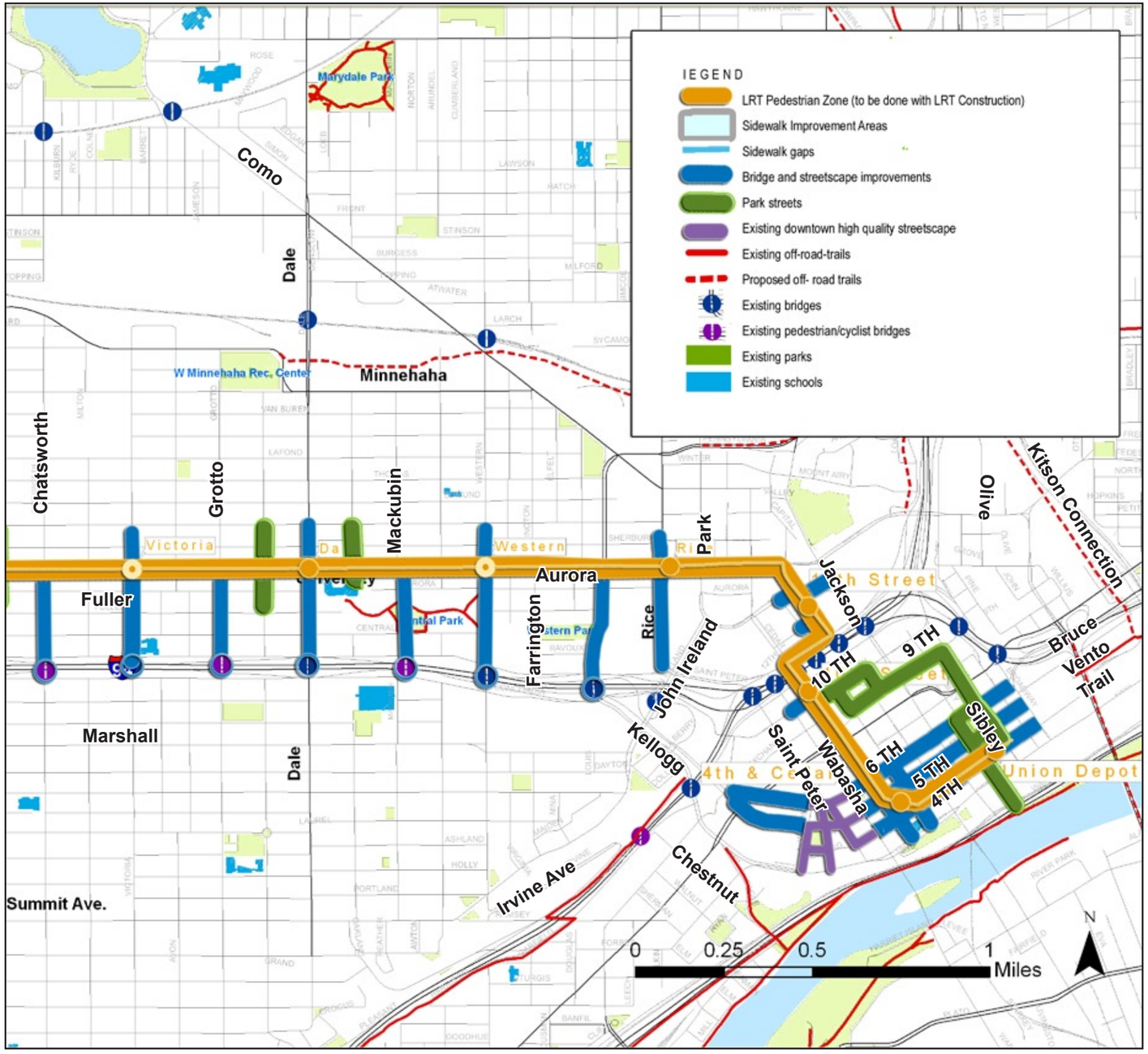
Eliminating sidewalk gaps on the west end of the corridor will improve pedestrian connectivity from work places to LRT stations

Redevelopment in the regional midway shopping district should better accommodate pedestrians with safe walkways from University Ave to building entrances.

photo credit: www.pedbikeimages.org Dan Bburden

Figure 7.2 Walk Framework





Downtown, extending the high quality streetscape east to Cedar on 4th, 5th and 6th Streets is a high priority.

Park streets linking downtown residential areas to downtown parks will make the city more livable.

Bike & Pedestrian Friendly Design

While new bikeways and walkways are a big part of making biking and walking safer and more convenient, there are several on-going actions that need to occur to make the Central Corridor a bicycle and pedestrian- friendly place. The combination of route improvements, land use and site design changes, and traffic calming will enhance bike and walking and increase non-motorized travel in Saint Paul. Keys to a bicycle and pedestrian friendly environment are:

Key Actions

7

Calm Traffic

The number one thing to create a pleasant and safe walking and biking environment is to slow traffic down. This can be accomplished by reducing the number of traffic lanes, narrowing lanes, adding landscaping to narrow and define the street, lowering speed limits, enforcing speed limits, reducing/eliminating the number of free right turn lanes and right turns on red. and right turns on red.

Create Complete Streets

As streets are rebuilt they should be designed to accommodate all modes of movement safely and conveniently – vehicle, transit, bike and walk. Saint Paul should adopt a Complete Streets ordinance/policy to assure that as streets and bridges are rebuilt either by the City, County or State, that provisions be made to accommodate all street users in balanced manner.

Change Land Use to a Mixed Use, Compact Development Pattern

This is a main focus of the *Central Corridor Development Strategy*. Mixed-use development results in housing close to shops, services and employment. That proximity greatly enhances the ability to walk, bike or take transit.

Design Buildings and Developments to Welcome Biking and Walking

This involves:

- Locating new buildings close to the street for easy pedestrian access and egress.
- Placing active uses, such as shops and restaurants, along street fronts and avoiding blank dead walks along streets. This helps create a lively and safe streetscape.
- Including secure bike parking inside offices and residential development and visitor bike parking. This includes adopting bike parking requirements for new development and redevelopment.

Improve Crosswalks

Add additional traffic signals along University Avenue. Increase the visibility of crosswalks with signage and enhanced pavement marking devices and advance stop bars. Adjust walk time allocation on signal cycle to assure adequate time for pedestrian crossing. Add pedestrian/bicyclist refuge islands at key un-signalized crossing points of major streets. Increase use of countdown walk signals.

Assure Well Maintained Walkways and Bikeways

Remove snow and debris from walkways and bikeways and from transit stops. Regularly maintain trails, lanes and walks as part of a pavement management program.

Key Actions

Install a Comprehensive Way-Finding System

Work to add a Corridor wide bike route wayfinding system consisting of route/directional/destination signs and pavement markings. Initially establish a wayfinding demonstration project connecting regional, commuter and local bikeway routes. Evaluate the test network and adjust before applying those design standards to the rest of the Corridor/City. Install pedestrian wayfinding in downtown and on station platforms. Make paper and digital bike route maps readily visible and accessible to all.

Enhance Streetscapes in Downtown and Along University Avenue

This includes adding landscaping to buffer pedestrians from traffic and to green the street, adding bike racks, and street furnishings, assuring an adequate sidewalk width and creating pedestrian places, (plazas, outdoor seating areas, etc.) where feasible, in redevelopment areas.

Promotion & Awareness

Making the physical environment safer and more pleasant for biking and walking is vital for increasing non-motorized and transit travel and for making Saint Paul the most livable city in America. However that work needs to be coupled with dedicated and on-going marketing, promotion and awareness efforts. Awareness of the opportunities and benefits of biking and walking is key to increasing mode share. There is a huge information gap in most people's knowledge of transportation options beyond the car. For example, many people do not know how to ride a bus, don't know where safe bike routes are, aren't aware of bike locker rental opportunities, and don't feel confident about riding or buying a bike. Those information gaps must be overcome to open a whole realm of potential walkers and bicyclists and to assure high LRT ridership.

Raising Awareness

8

Tasks

Hire a full-time Bicycle, Pedestrian and Complete Streets Coordinators and part time bike-walk ambassadors:

A full-time staff position is warranted to help guide efforts in bike and walk funding, panning design and implementation. Part-time seasonal bike ambassadors can be a cost effective method of outreach and awareness to neighborhoods, businesses and organizations. The long range goal is to have three full time staff: a bike coordinator, a pedestrian coordinator and a complete streets coordinator.

Commit to fund bicycle and pedestrian improvements:

Biking and walking constitute approximately 10% of all trips, yet they receive substantially less than 10% of transportation funding. A commitment to funding bike-walk improvements is crucial to the success of LRT and making Saint Paul more livable.

Adopt a coordinated partnership approach to bike-walk marketing and promotion:

City staff (across departments) should partner with Smart Trips, schools, neighborhoods, Met Council, adjoining cities, Ramsey County, bike shops, bike clubs, business organizations, Saint Paul and Minnesota Tourism, etc. on a coordinates, strategic approach to making people aware of the opportunities to bike or walk.

Potential programs and activities:

- School and community education classes – Bike riding classes, bike safety, bike commuting, bike maintenance, bike purchasing. Consider mobile education and outreach – State Fair, employers, events, etc. Have "walking buses" of school children walking to school holding a yellow rope. Target youth – Family bike safety, bike with Big Bird, bike safety officers in schools, bike mascot (ala McGruff).
- Employee bike purchase/subsidy programs in lieu of car parking subsidies.
- Hold road closure to vehicle days.
- Hold weekly/monthly ride of Central Corridor bike routes organized thru the Bicycle Advisory Board, Twin City Bicycle Club or others.
- Promote a downtown bike taxi service.
- Establish a bike re-use/access program– Have donated bikes and police recovered bike upgraded and sold cheap to target groups/neighborhoods.
- Promote development of bike and pedestrian oriented businesses – I.e. One on One coffee shop, Portland/Seattle Bike station/bar/cafe.
- Hold ride/walk with the Mayor/City Council days.
- Hold bike/walk rodeos/carnivals – Theme contests, art/costumed bikes, tricycle racing, bike light/pedometer give-aways, bike parade, walking parade, dog walking parade.
- Use door hanger notices for bike facility construction/striping.
- Hold a free bike on train weekend (during lower ridership).

Use digital methods:

Web sites/links are the most cost effective outreach strategy. Make them easy to use and entertaining -i.e. a Cyclopath style bike routing on-line tool, You Tube style videos i.e. Bikes on Board video, etc.

Work with bicycle advocates, property owners, business and developers to get secure bike storage at key Corridor locations.

Establish a "spot improvement service":

Create a web link, email address and phone number to allow people to report walk or bike problem areas and have an established means to respond to and repair those problem areas.

Track the performance of the Minneapolis bike share program and determine suitability for Saint Paul.

Above: program to encourage walking; Below: bike friendly businesses can get bikes on the streets, raising awareness

Above: The Saint Paul Classic is an existing event that raises biking awareness; Below: Programs aimed at children focus on safety

Photo Credit: www.ped

Photo Credit: www.pedbike.org D

Priority Actions & Implementation

Insert Intro

Bike Recommendations – Central Corridor

Pelham Boulevard/Raymond Avenue

This bikeway is part of the Saint Paul Grand Rounds and such deserves enhanced landscaping and amenities for cyclists. While a combination of bike lanes and share the road treatments currently exist on the route it is inconsistent and confusing to cyclists. There should be an effort to work towards dedicated bike lanes and where space constraints make lanes impossible, seamless transitions to sharrows pavement markings. The bicyclist and pedestrian treatment should be on par with the Grand Rounds designation.

Near-term actions

- Improve way-finding signage.
- Add sharrows pavement markings on share-the-road segments.

Long-term actions

- When road improvement projects are made, capture space for missing on-road bike lanes.
- Develop and implement a comprehensive signage and wayfinding strategy for the Saint Paul Grand Rounds.
- Develop a "greening strategy" to give the route more of a parkway feel.

Midtown Greenway Extension – Ayd Mill Road Trail

When complete, this off-road trail will be a key link between the Central Corridor and the rest of the City, and eventually to Minneapolis.

Short term actions

ADD TEXT – What is the city doing now??

Long-term actions

- Construct the trail.
- Link to Minneapolis Midtown Greenway with a new bridge over the Mississippi River.

Pierce Butler Route

The long-term vision for the Pierce Butler bikeway is a ten foot wide separated bike trail along the south side continuous from Transfer Road to the Bruce Vento Trail as well as on-road bike lanes. An off-road bike trail connection (St. Anthony Greenway) from Transfer Road west to connect to Minneapolis's planned Granary Road and the Minneapolis Grand Rounds is also recommended. Making this connection would create a continuous off-road trail linking the Stone Arch Bridge in Minneapolis, the University of Minnesota's Minneapolis and Saint Paul campuses to the Lake Phalen Area and William Munger Trail and would become one of the most important commuter and recreational connections in the metropolitan area.

Near- term actions

- Add striped bike lanes on existing road.
- Reducing the speed limit from 40MPH to 30 MPH.
- Assess the feasibility of a separated off-road trail along the south side of the existing road.
- Add traffic calming measures and wayfinding signage at intersecting north-south bikeways.

Long-term actions

- Build an off-road trail and on-road bike lanes along the Pierce Butler Extension in conjunction with road construction.
- Assess the feasibility of a trail link to Minneapolis on the St. Anthony Greenway
-

Griggs Street

Griggs Street makes the regional connection between the Central Corridor and the north. Griggs' proximity to Lexington Avenue, its soon to be rebuilt bicycle/pedestrian bridge over I-94 with ornamental railings and lighting; and its connection to the Summit Avenue Bikeway and future Midtown Greenway Extension make it an ideal route. The existing bridge over the railroad tracks to the north at Hamline should be used as a connection, albeit indirect, to the Lexington Bikeway north of Energy Park Drive. Wayfinding signage and pavement markings will be key to making the route from Griggs Street to the existing trail on Lexington Parkway to the north legible.

Near-term actions

- Install striped bike lanes from Summit Avenue to Pierce Butler Route.
- Install pedestrian/bicycle crossings and wayfinding signage at intersections of Pierce Butler Route with Griggs Street and Pierce Butler Route with Hamline Avenue.
- Install wayfinding pavement markings and signage from the Lexington Parkway Trail to the Hamline Avenue pedestrian bridge over the railroad tracks.
- Study the possibility of relocating the Hamline pedestrian to Griggs and the potential for a more direct connection to Lexington.

Long-term actions

- Construct a new pedestrian and bicycle bridge over the railroad tracks or replace and extend the Hamline bridge and bikeway route to the north of Pierce Butler.

Prior Avenue

Prior Avenue will be the primary commuter bikeway from Summit Avenue to Pierce Butler on the west side of the Corridor. Bike lanes exist from University Avenue to Pierce Butler Route.

Near-term actions

» Install striped bike lanes from Summit Avenue to University Avenue.

Long-term actions

» Improve conditions at the I-94 overpass by adding lighting and buffers from traffic.

Mackubin Street

Mackubin Street will be the primary commuter bikeway from Summit Avenue to Pierce Butler Route on the east side of the Central Corridor.

Near-term actions

» Install striped bike lanes from Summit Avenue to Minnehaha Avenue

» Improve lighting and approach visibility on existing pedestrian/bike bridge over I-94

Long-term actions

» When pedestrian/bike bridge is replaced, widen to better accommodate pedestrian and bikes, improve the approach ramps, and add ornamental railings.

» Connect to Pierce Butler Route when it is extended to the east.

Minnehaha Avenue

This is the main commuter route for east-west movement in the Central Corridor north of I-94.

Near-term actions

» Install bike lanes where there are existing gaps.

» If space constraints exist in these areas, install sharrow pavement markings and work towards long-term goal of installing bike lanes.

Marshall Avenue

This is the main commuter route for east-west movement in the Central Corridor south of I-94.

Near-term actions

» Continue to reconfigure the street with dedicated bike lanes similar to the existing treatment between Cretin Avenue and X west to the river and east to Victoria Avenue.

» Install a bike boulevard treatment where the road narrows, from Victoria Avenue to X

» From X to X, when the street becomes one-way, install a bike boulevard treatment with sharrow markings in the direction of east bound traffic and a contra-flow bike lane for east bound bike movement.

Charles Avenue from Prior Avenue to Mackubin Street

Charles Avenue will be a bike boulevard and provide for local bike movement parallel to University Avenue. It is intended that this bikeway be built in the near term so that there is an alternative to University Avenue for bikes during the LRT construction process.

Near term actions

» Install a bike boulevard treatments on Charles Avenue from Prior Avenue Como Avenue including sharrow pavement markings, refuge islands on Snelling Avenue, Lexington Avenue and Dale Street, circular planters at intersecting commuter bikeways and planted pedestrian bump outs at streets connecting to the LRT station platforms.

Long-term actions

» Obtain right-of-way or easements to realize the long-term routes from Aldine Avenue to Prior Avenue and Farrington Avenue to Park Street.

Territorial Road from Pierce Butler Route to the U of M Transitway

This bikeway will make a much needed link between the University of Minnesota and the Central Corridor. This bikeway will also be the only near term route over the railroad corridor between Cleveland Avenue and Prior Avenue.

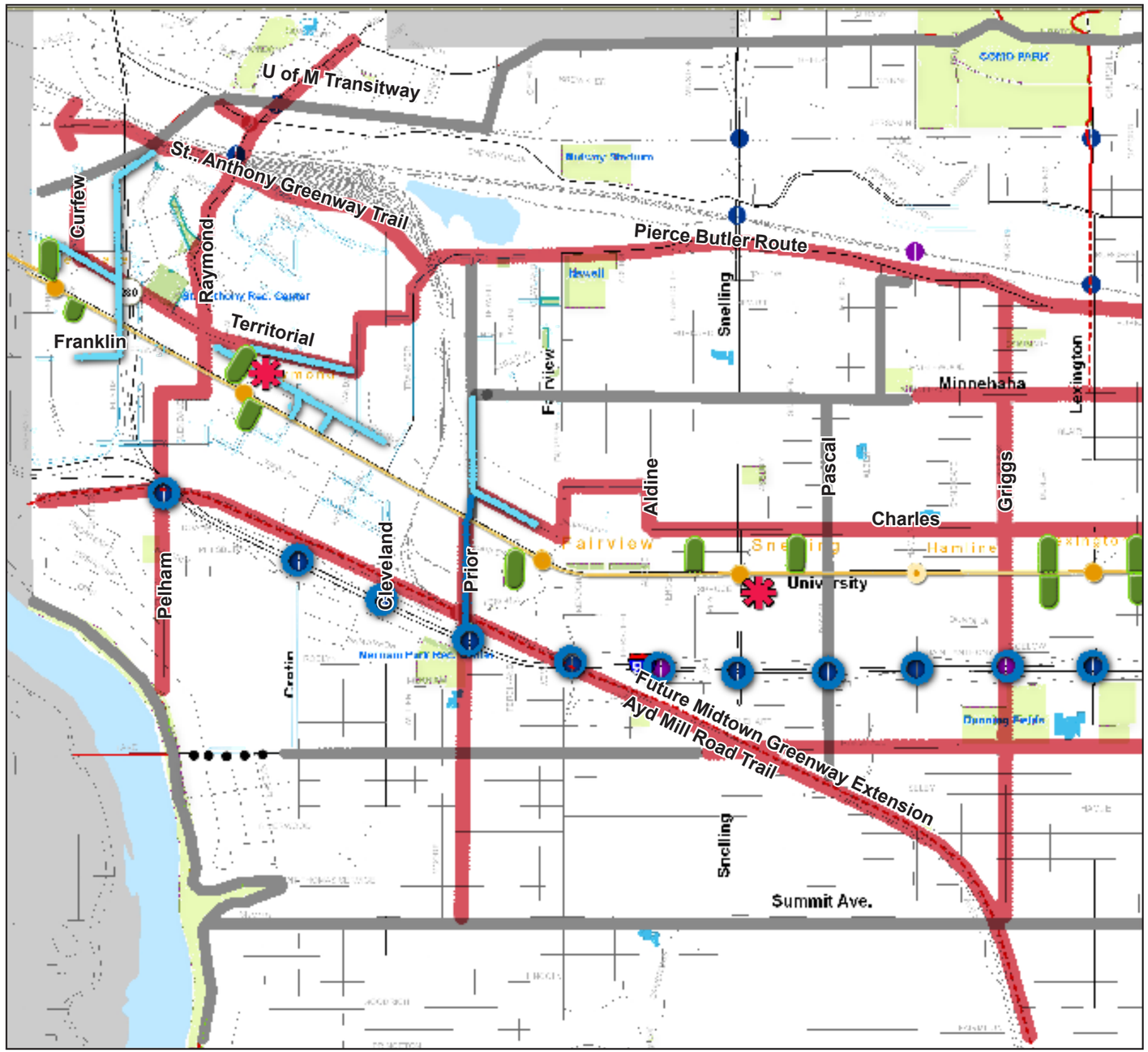
Near term actions

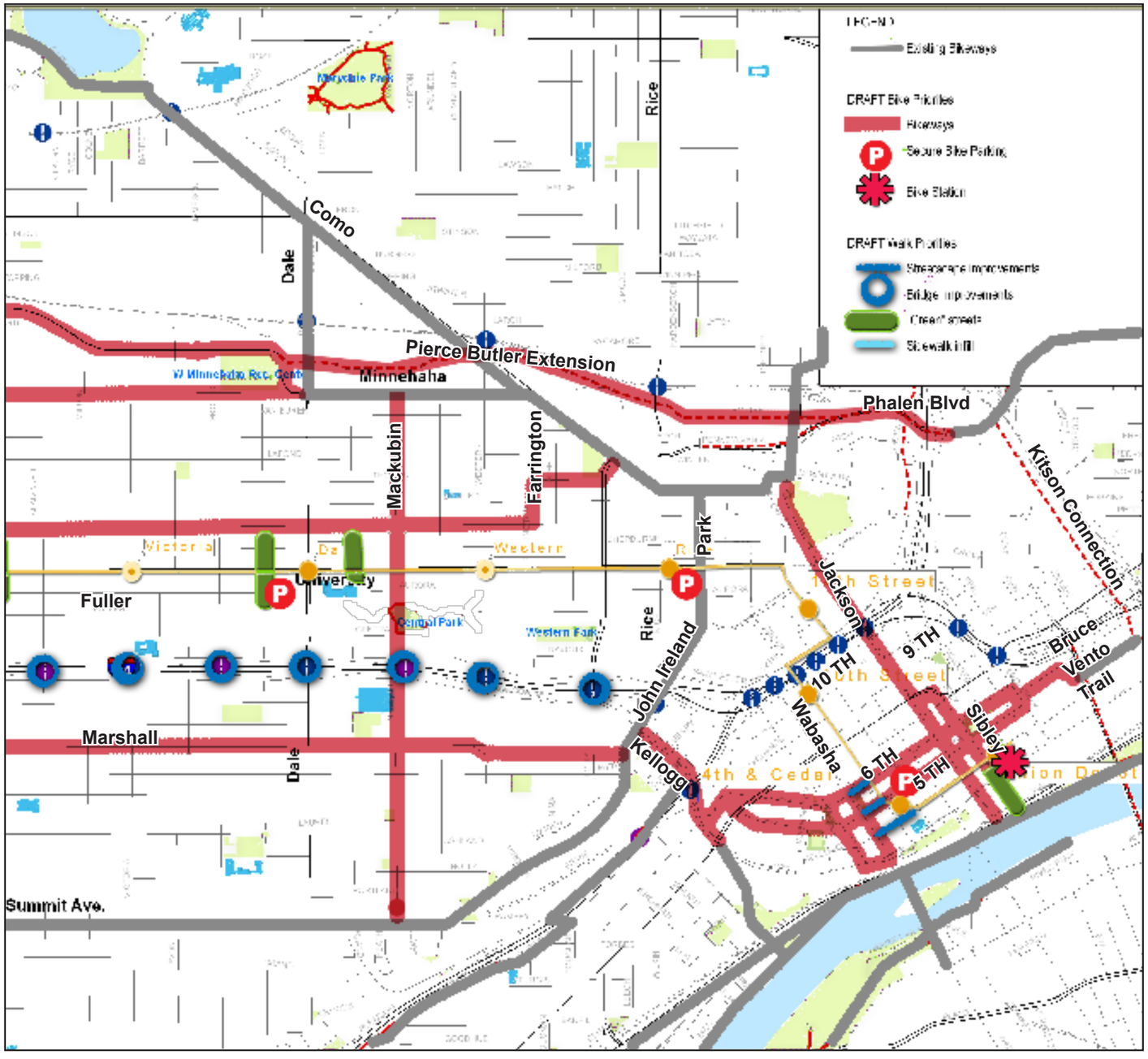
» Install bike boulevard treatments.

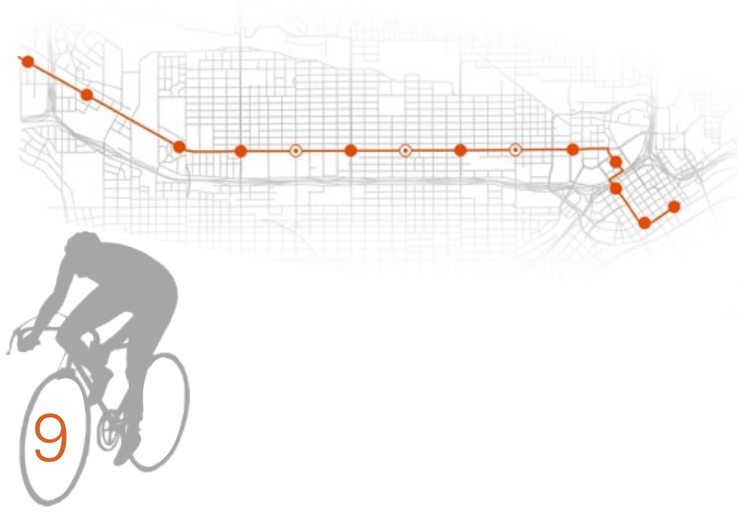
» Install wayfinding and directional signage where the route jogs between Cleveland Avenue and Vandalia Street.

9

Figure 9.1: Priority Bike-Walk Recommendations




Existing Bikeways
DRAFT Bike Priorities
Bikeways
Secure Bike Parking
Bike Station
DRAFT Walk Priorities
Streetscape improvements
Bridge improvements
Crosswalks
Sidewalk infill
Como
Dale
Rice
Pierce Butler Extension
Minnehaha
Phalen Blvd
Kitson Connection
Mackubin
Farrington
Park
Jackson
Fuller
University
Western
Rice
John Ireland
9 TH
Bruce Vento Trail
10 TH
Wabasha
Sibley
Kellogg
4th & Cedar
6 TH
5 TH
Marshall
Dale
Summit Ave.



Kellogg Boulevard from John Ireland Boulevard to Smith Street

Because Kellogg Boulevard is an important gateway to downtown and makes regional recreation and commuter connections it is essential that it be designed for all levels of cyclists, from novice to expert. To this end, the long term vision for this bikeway is off-road trails on either side of the road and on-road bike lanes in each direction.

Near-term actions

» Assess the feasibility of adding a separated off-road trail from John Ireland Boulevard to Summit Avenue on both sides of Kellogg Boulevard and if feasible install it.

» From Summit Avenue to Smith Street, sign the existing ten foot wide sidewalk on each side of the road as a shared bike-walk trail, where feasible, expand the sidewalk to 15 feet wide.

» Designate the right lane in each direction as share-the-road with sharrow markings and install share-the-road signage.

» Install wayfinding signage to connect the trail on west side of I-35E, Fifth Street and Sixth Street bikeways, John Ireland Boulevard Bikeway and Summit Avenue Bikeway.

» Improve the crosswalk at the Minnesota History Center intersection with yellow flashing lights.

Long- term actions

» Reconfigure the road to accommodate a dedicated six foot wide bike lane in each direction.

Fifth and Sixth Streets

Fifth and Sixth Streets are one-way pairs and are the principal streets for east-west bike movement through downtown.

Near-term actions

» Convert the existing bus-only lane to a shared bus/bike lane.

Long-term actions

» Work towards and advocate for a dedicated bike lane traveling in the direction of traffic through elimination of parking, travel lanes or reduction of lane widths.

Sibley Street/Jackson Street

These streets make important regional connections between the Sam Morgan Trail along the Mississippi River and Lake Phalen Trail to the north. Jackson Street is the principal gateway to downtown from the north.

Near-term actions

» Install bike lanes in

» each direction on Jackson Street, between 12th Street and 7th Street by reducing the number of travel lanes from six to four.

» Between Kellogg Boulevard. and Shepard/Warner Road install bike lanes, signage, and reconfigure the intersection at Shepard/Warner Road as recommended in Section 4.

» On Sibley Street, install a bike lane by reducing travel lane widths and eliminating parking on one side of the street. Where space constraints make this unfeasible, install sharrows pavement markings

Bike Parking and Secure Storage Recommendations

Near-term actions

- Provide bike parking to meet forecast demand near all LRT station platforms.
- Work to establish secure bike storage near the Snelling Avenue, 4th /Cedar and Union Depot stations.
- Add bike racks at key retail/restaurant locations along University Avenue as part of streetscape improvements.

Long-term actions

- Establish a full service bike stations at Union Depot, Raymond and Snelling
- Add secure bike storage near Dale Avenue and Rice Street stations.

Bike Route Wayfinding

Near-term actions

- Prepare a detailed Bikeway Wayfinding Plan that includes sign design, design protocol, selection of sign locations and determination of destination names.
- Install wayfinding signs in a test section of the Corridor (Prior Avenue to Griggs Street between Summit Avenue and Pierce Butler Route). Evaluate their performance before installation in the rest of the Corridor.

Long-term action

- Install a comprehensive wayfinding signage and pavement marking throughout the Corridor and extend it City-wide.

Pedestrian and Bicycle Friendly Recommendations

Near-term action

- Saint Paul should adopt a Complete Streets ordinance/policy to assure that as streets and bridges are rebuilt either by the City, County or State, that provisions are made to accommodate all street users (pedestrians, bicyclists, motorists, and public transport).in balanced manner.

On-going actions

- Make a committed effort to slow down traffic to create a pleasant and safe walking and biking. This can be accomplished by reducing the number of traffic lanes, narrowing lanes, adding landscaping to narrow and define the street, lowering speed limits, enforcing speed limits, reducing/eliminating the number of free right turn lanes and right turns on red.
- Assure well maintained walkways and bikeways. Require removal snow and debris from walkways and bikeways and from transit stops. Regularly maintain trails, lanes and walks as part of a pavement management program. Create a spot improvement program to allow prompt attention to maintenance or operational issues.
- Design buildings and developments to welcome biking and walking and work to create a compact, mixed use development pattern. This includes requiring provision of bicycle parking in new development and redevelopment.

Long term actions

- Enhance streetscapes in downtown and along University Avenue by adding landscaping to buffer pedestrians from traffic and to green the street, adding bike racks, and street furnishings, and assuring an adequate sidewalk width.

Bike-Walk Program Recommendations

Near term actions

- » Hire a full-time bicycle, pedestrian, and complete streets coordinators to help guide efforts in bicycle and pedestrian funding, planning design and implementation.
- » Prepare a city-wide bikeway route map in paper and digital format which shows existing and planned bikeways. Make the bikeway map very accessible to residents, workers, and visitors.
- » Support regional efforts to produce an on-line, on-demand bike route planning tool.
- » Consider mobile education and outreach for biking and walking at the State Fair, employers, events, etc.
- » Hold road closure to vehicle days to get people downtown on bikes and walking.

On-going actions

- » Commit to fund bike-walk improvements commensurate with their importance in the transportation system and in making Saint Paul more livable.
- » Adopt a coordinated partnership approach to bike-walk marketing and promotion. Partner with allied organizations and groups, such as, but not limited to, Smart Trips, schools, neighborhoods, Met Council, adjoining cities, Ramsey County, bike shops, bike clubs, business organizations, Saint Paul and Minnesota Tourism to bridge the information and awareness gap and to increase bike walk mode share.

Priority Walk Recommendations

Downtown:

- » Extend the high quality streetscaping east of Wabasha Street along Fourth, Fifth and Sixth Streets.
- » Improve lighting, "greening" (adding street trees and other landscaping) and wayfinding on Sibley Street from Mears Park to the Mississippi River.

Central Corridor

- » I -94 bridge improvements – add lighting, railings, landscaping, safer approaches, and signed crosswalks
- » Pedestrian Improvements –improve safety on Prior Avenue (Marshal to University) with better lighting, pedestrian buffers and filling in sidewalk gaps.
- » Add walkways with streetscape buffers on Cretin Avenue by the Town and Country Golf Course.
- » Add new sidewalks to fill major gaps in the west Midway Area
  - Create a walkway route on extending from Charles Avenue east of Fairview Avenue.
  - Create landscaped local street connections between Charles Avenue and University Avenue at LRT station platforms.
  - Add sidewalks to Territorial, Robbins Street, and Berry